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CALIFORNIA STATE POLYTECHNIC COLLEGE BULLETIN

CATALOG ISSUE
1951-1952



SAN LUIS OBISPO AND SAN DIMAS
CALIFORNIA

CALIFORNIA STATE
POLYTECHNIC COLLEGE
BULLETIN

SAN LUIS OBISPO

and the

VOORHIS UNIT
SAN DIMAS, CALIFORNIA

CATALOG ISSUE
1951-1952

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CALIFORNIA STATE POLYTECHNIC COLLEGE

CALENDAR, 1951-52

Summer Quarter—1951

Four Weeks Term

June 21	Thursday. Registration and Examination of New Students (continuing through June 22)
June 23	Saturday, 8 a.m. Registration and Scheduling of Old Students Saturday 10 a.m. Scheduling of New Students
June 25	Monday. Classes Begin for All Students
July 4	Wednesday. Independence Day Holiday
July 19-20	Thursday-Friday. Final Examinations

Six Weeks Term

July 19	Thursday. Registration and Examination of New Students (continuing through July 20)
July 21	Saturday, 8 a.m. Registration and Scheduling of Old Students Saturday, 10 a.m. Scheduling of New Students
July 23	Monday. Classes Begin for All Students
Aug. 30-31	Thursday-Friday. Final Examinations

Fall Quarter

Sept. 10	Monday. Beginning of Regular Academic Year
Sept. 12	Wednesday. Registration and Examination of New Students (continuing through September 13)
Sept. 14	Friday. Registration and Scheduling of Old Students
Sept. 15	Saturday. Scheduling of New Students
Sept. 17	Monday. Classes Begin for All Students
Sept. 22	Saturday (noon). Last Day for Returning Registration Cards
Oct. 5	Friday. Last Day Classes May Be Added or Dropped Without Penalty
Oct. 22-26	Mid-term Examinations Week
Nov. 12	Monday. Armistice Day Holiday
Nov. 21 (noon)-24	Thanksgiving Holiday
Dec. 10-15	Monday-Saturday. Final Examinations
Dec. 15	Saturday. End of Fall Quarter
Dec. 17-Jan. 1	Christmas Holiday

Winter Quarter

Dec. 27	Thursday. Registration and Examination of New Students (continuing through December 28)
Jan. 3	Thursday, a.m. Registration and Scheduling of Old Students
Jan. 3	Thursday, 2.30 p.m. Scheduling of New Students
Jan. 4	Friday. Classes Begin for All Students
Jan. 10	Thursday. Last Day for Returning Registration Cards
Jan. 25	Friday. Last Day Classes May Be Added or Dropped Without Penalty
Feb. 11-16	Mid-term Examinations Week
March 17-22	Monday-Saturday. Final Examinations
March 22	Saturday. End of Winter Quarter

Spring Quarter

March 20	Thursday. Registration and Examination of New Students (continuing through March 21)
March 25	Tuesday, a.m. Registration and Scheduling of Old Students
March 25	Tuesday, 2.30 p.m. Scheduling of New Students
March 26	Wednesday. Classes Begin for All Students
April 1	Tuesday. Last Day for Returning Registration Cards
April 11-12	Easter Holiday
April 16	Wednesday. Last Day Classes May Be Added or Dropped Without Penalty
April 19	Saturday. Poly Vue (San Dimas)
April 24	Thursday. Last Day for Filing Approved Theses With the Registrar
April 24	Last Day for Filing for June Commencement
April 25-26	Friday-Saturday. Poly Royal
May 1	Last Day for Filing for Master's Comprehensive Examination
May 5-10	Monday-Saturday. Mid-term Examinations Week
May 30	Friday. Memorial Day Holiday
June 7-13	Final Examinations
June 14	Saturday. End of Spring Quarter. Commencement
June 15	Sunday. End of Regular Academic Year

Tentative Summer Quarter—1952-53

Four Weeks Term

June 19	Thursday. Registration and Examination of New Students (continuing through June 20)
June 21	Saturday, 8 a.m. Registration and Scheduling of Old Students
June 21	Saturday, 10 a.m. Scheduling of New Students
June 23	Monday. Classes Begin for All Students
July 4	Friday. Independence Day Holiday
July 17-18	Thursday-Friday. Final Examinations

Six Weeks Term

July 17	Thursday. Registration and Examination of New Students (continuing through July 18)
July 19	Saturday, 8 a.m. Registration and Scheduling of Old Students
July 19	Saturday, 10 a.m. Scheduling of New Students
July 21	Monday. Classes Begin for All Students
Aug. 28-29	Thursday-Friday. Final Examinations

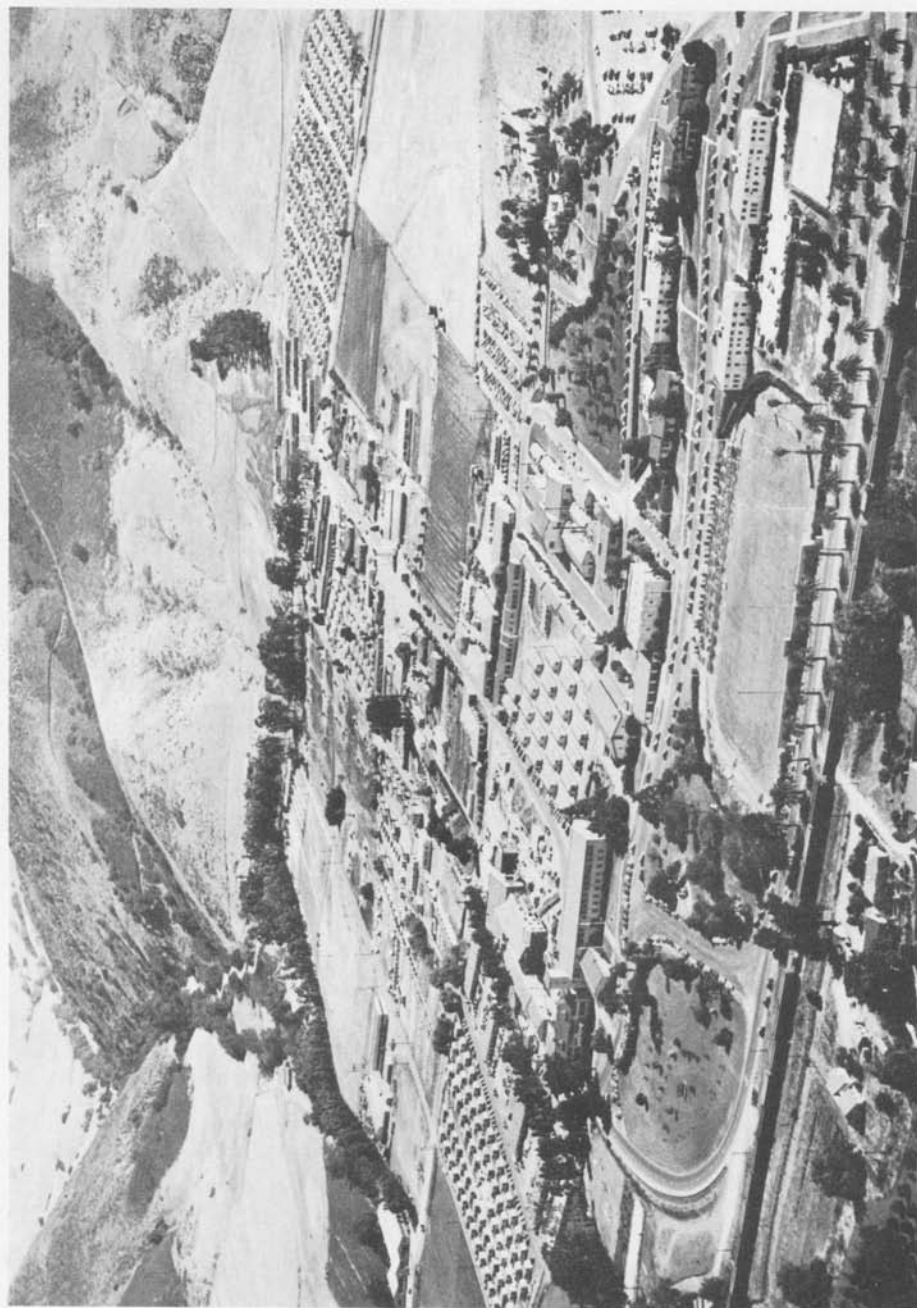
CALIFORNIA STATE POLYTECHNIC COLLEGE

SAN LUIS OBISPO AND SAN DIMAS, CALIFORNIA



Above: The administration - classroom building is situated on a knoll near the center of the 2,233-acre campus and farm at San Luis Obispo, which is just halfway between Los Angeles and San Francisco. The main line of the Southern Pacific Railroad and Roosevelt Highway both bisect the campus, while Highway 101 is less than one mile from the college property.

Left: The beautiful nonsectarian chapel on the Voorhis campus, San Dimas, overlooks the vast citrus empire at the base of snow-capped Mt. Baldy. The Voorhis Unit of California State Polytechnic College is located in the heart of the citrus, truck crops, and commercial ornamental horticultural production areas of Southern California.



Campus and Farm, California State Polytechnic College, San Luis Obispo, California

FOREWORD

California State Polytechnic College is dedicated to the principle that students need to know the technical and manual processes in agriculture, engineering, and other occupational fields, as well as the theories which govern these processes, and further, that students who intend to become teachers in these and related subjects should master practical techniques in addition to teaching methods.

This phase of occupational training complements the older, more orthodox concept of higher education as a process of developing the mind toward creative thinking. To the theory that higher education should confine itself to broad, cultural training leading to professional careers, the California State Polytechnic College has added a new concept—that of providing occupational training on a college level leading to technical or vocational as well as professional careers.

In many states, this need for a dual concept of higher public education is recognized in the organization of the collegiate system. A university dedicated to the fine arts and sciences is paralleled by a college of agriculture and mechanic arts, each providing a necessary function in the training of the young people of the State.

When the California State Polytechnic College was established in 1901, the founders had in mind such a service. The legislative act which created the school included the statement that "the purpose of the school is to furnish to young people of both sexes mental and manual training in the arts and sciences, including agriculture, mechanics, engineering, business methods, domestic economy, and such other branches as will fit the students for the nonprofessional walks of life." It further stated that "this article shall be liberally construed, to the end that the school may at all times contribute to the industrial welfare of the State."

In carrying out the responsibility of providing California young people with an agriculture and mechanic arts type of education on a college level, California State Polytechnic College differs in three major respects from the typical "A & M" college:

1. California Polytechnic places major emphasis on instruction rather than on research.
2. It uses an unique project system of instruction which incorporates the philosophies of "learning by doing" and "earning while learning."
3. It uses an "upside down" educational plan, which is characterized by the grouping of as many technical and job-getting courses in the first two years as possible. The total course content of any of the four-year curricula is substantially the same as in a similar major in a typical "A & M" college—but is offered in an inverted order.

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CALIFORNIA STATE POLYTECHNIC COLLEGE

Administered by

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THE STATE DEPARTMENT OF EDUCATION

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DR. JOEL A. BURKMAN	Assistant Division Chief, State Colleges and Teacher Education
JULIAN A. MCPHEE	President, California State Polytechnic College, San Luis Obispo and San Dimas
WESLEY P. SMITH	State Director of Vocational Education

THE CALIFORNIA STATE POLYTECHNIC COLLEGE

JULIAN A. MCPHEE	President
HAROLD O. WILSON	Executive Dean
C. O. MCCORKLE	Dean of Instruction
DONALD S. NELSON	Business Manager
J. CORDNER GIBSON	Dean, Voorhis-Kellogg Units
EVERETT CHANDLER	Dean of Students
RALPH PRIESTLEY	Dean, Engineering Division
VARD SHEPARD	Dean, Agricultural Division
HUBERT SEMANS	Acting Dean, Liberal Arts Division
C. PAUL WINNER	Admissions Officer
LEO F. PHILBIN	Registrar
LEONA M. BOERMAN	Secretary to the President

HISTORY

When California State Polytechnic was established in 1901 by the Legislature of the State of California, no level of instruction was proposed in the act which created the school. It opened as a state vocational high school and was the forerunner in California of vocational education along agricultural and industrial lines. When the idea of vocational education spread to the district high schools and ultimately became a part of the basic federal and state programs of education, California State Polytechnic continued in its role as a pioneer of vocational education. When the district high schools began providing adequate vocational instruction on a high school level, California State Polytechnic raised its level of instruction in 1927 to that of a junior college.

In 1933, when the school was made a direct administrative branch of the State Department of Education and at the same time was placed under the guidance of the Chief of the Bureau of Agricultural Education, it was changed from a junior college to a two-year and three-year technical college. The Chief of the Bureau of Agricultural Education retained the dual office from 1933 until 1945, at which time he became State Director of Vocational Education, but retained the presidency of the college. He resigned from the position of Director of Vocational Education to devote full time to the duties of the president of the college January 1, 1949.

In 1936 a degree-transfer program was added, and in 1940 the State Board of Education authorized the college to grant the Bachelor of Science degree for completion of the four-year curriculum. The first baccalaureate exercises were held in 1942.

For a period of 15 years California State Polytechnic gave skills and methods courses for agriculture teacher candidates in cooperation with the University of California, which accepted this credit toward meeting requirements of special teaching credentials in vocational agriculture. When Senate Bill No. 788 was passed in 1946 allowing state colleges to give a fifth year of instruction, the California State Polytechnic expanded its services and was accredited by the State Board of Education to recommend students directly for the special secondary credential in vocational agriculture and the special secondary limited credential in agriculture. Early in 1947 the State Board of Education granted the college the privilege of giving the training for prospective physical education teachers and recommending graduates for the special secondary credential in physical education.

In April, 1948, the California State Board of Education approved the college to recommend graduates for the general secondary teaching credential in any of the following majors: social studies, mathematics, physical science and general science, life science and general science, agriculture, and physical education.

In 1938, a completely equipped school and farm near San Dimas, in Los Angeles County, admirably situated and adaptable for technical instruction in citriculture, deciduous fruit production, agricultural inspection, and landscape gardening, was deeded to California Polytechnic by its owners, Charles B. Voorhis of Pasadena, and his son, former Congressman Jerry Voorhis. This magnificent gift was immediately put to use as a plant industries branch of the college. Although it was necessary to close the Voorhis Unit during the war period, 1942-45, it was reopened in the fall of 1945.

Because the college was equipped with the facilities and the educational pattern capable of training skilled workmen quickly, the Federal Government called upon California Polytechnic College in 1940 to take over a share of the national defense, and later war production, training courses. National defense training classes began at California Polytechnic on September 3, 1940, at the very inception of this program in the United States. Some of the subjects were offered 24 hours a day, seven days per week.

From January, 1943, to November, 1944, more than 3,600 naval aviation cadets were trained at the California Polytechnic Naval Flight Preparatory School. Another 1,100 trainees received instruction in a Naval Academic Refresher Unit operated from July, 1944, until February, 1946.

Despite the fact that the naval aviation training activities of the college during the three-year period were conducted on an "all-out" basis, all regular activities of the college were maintained with no cessation of educational service. The faculty was retained with little change, with most faculty members instructing both civilian and naval students.

Another wartime activity of California Polytechnic which was concluded during the calendar year of 1946 was that of the Food Production War Training program. This program closed officially on June 30, 1946, after three years of service in training more than 123,000 California farmers and members of farm families. California Polytechnic served as state headquarters, and the president of the college was state director of this program.

On October 1, 1949, the college was approved to grant the degree of Master of Arts with concentrations in agriculture, biological science, mathematics, health and physical education, physical science, and social science.

In November, 1949, the college received as a gift from the Kellogg Foundation the four-million-dollar, 812-acre Kellogg Arabian Horse Ranch near Pomona. The property along with some 50 blooded Arabian brood mares and stallions was donated to the college for advancement of practical education and for the perpetuation and improvement of the Arabian horse breeding program of America. The property, now known as the Kellogg Unit, California State Polytechnic College, lies approximately one mile from the edge of the Voorhis Unit campus, and is one mile from the City of Pomona. Formerly known as the Kellogg Arabian Horse Ranch, it was founded in 1925 by W. K. Kellogg.

Considerable growth in land and facilities of the college has been necessary to keep stride with the demand on the part of students for wider offerings in agriculture, engineering, and related fields. Descriptions of the college's lands, buildings, and other facilities will be found in the section on General Information.

The college offers the Bachelor of Science degree for completion of the four-year curriculum in the following majors:

Agriculture—Agricultural Engineering and Mechanics, Agricultural Inspection, Animal Husbandry, Field Crops, Truck Crops, Deciduous Fruit Production, Citrus Fruit Production, Dairy Husbandry, Dairy Manufacturing, Ornamental Horticulture, Poultry Husbandry, General Crops Production, Soils Science.

Engineering—Aeronautical Engineering, Air Conditioning and Refrigeration Engineering, Architectural Engineering, Electrical Engineering, Electronic and Radio Engineering, Mechanical Engineering, Maintenance Engineering, Printing.

Liberal Arts—Social Science, Mathematics, Biological Science, Physical Science, Physical Education, and Agricultural Journalism.

FACULTY COMMITTEES

SAN LUIS OBISPO

The following faculty committees will serve at the San Luis Obispo campus during the school year, 1951-52.

President's Council—Mr. Wilson, Chairman; Mr. Chandler, Mr. Gibson,* Mr. McCorkle, Mr. Nelson, Mr. Priestley, Dr. Semans, Mr. Vard Shepard.

Dean's Committee on Instruction—Mr. McCorkle, Chairman; Mr. Cook, Secretary; Mr. Gibson,* Mr. Priestley, Dr. Semans, Mr. Vard Shepard.

Alumni Activities—Mr. Beck, Chairman; Mr. Deuel, Mr. Davidson, Mr. House,* Mr. J. Jones, Mr. Jorgensen, Mr. Kennedy, Mr. Metz, Mr. Wineroth, Mr. Kitch.

Campus Development—Mr. Cook, Chairman; Mr. Lonborg, Mr. Howes, Mr. Miller, Mr. Priestley, Mr. Troutner, Dr. Whitson, Mr. Chandler.

Catalog—Mr. Kennedy, Chairman; Mr. Cook, Mr. Leary, Miss Marston, Mr. Radius, Mr. Riebel.

Class Advisors and Graduation—Mr. Lonborg, Chairman; Senior Class, Mr. Ellis; Junior Class, Mr. Milham; Sophomore Class, Mr. Pursel; Freshman Class, Mr. Riebel.

Farm Advisory—Mr. Vard Shepard, Chairman; Mr. Bennion, Mr. Campbell, Dr. Carter, Mr. Dougherty, Mr. Drumm, Mr. Merson, Mr. J. I. Thompson.†

Gifts, Trusts, and Scholarships—Mr. Meacham, Chairman; Dr. Bowls, Mr. Stanton Gray, Mr. Gustafson, Mr. J. Jones, Mr. Nelson, Mr. Radius, Mr. J. I. Thompson,† Mr. Gibson.*

Host—Mr. Beck, Chairman; Mr. Allen, Mr. Bloom, Mr. Bromley, Mr. Deuel, Mr. Hardgrove, Mr. Kitch, Mr. Milham, Mr. Noggle, Mr. Philbin, Mr. Remund, Mr. Steuck.

Library—Mr. Bromley, Chairman; Mr. Dougherty, Mr. Garter, Mr. Highum, Dr. Hoover, Mr. Johnston, Mr. McNeely, Mr. Maurer, Mr. Roney, Mr. Sankoff, Mr. J. Smith, Mr. Vorhies, Mr. Whiting, Mr. Wiley.

Placement—Mr. J. Jones, Chairman; Mr. Priestley, Mr. Leach, Mr. McCorkle, Mr. Matthew, Dr. Semans, Mr. Vard Shepard, Mr. Winner, Mr. Gibson.*

Public Relations—Mr. Cruikshanks, Chairman; Dr. Carter, Mr. Couper,† Mr. Davidson, Mr. Gibson,* Mr. Kennedy, Mr. J. McGrath, Mr. Merson, Mr. Wiley, Mr. Wineroth.

Student Loans—Mr. McFarland, Chairman; Mr. Beck, Mr. House,* Mr. Knott, Mr. Chandler, Mr. Nelson.

Student Welfare and Activities—Mr. Milham, Chairman; Mr. Warren Anderson, Mr. Beck, Mr. Davidson, Mr. Hammitt, Mr. House,* Mr. Hoyt, Mr. Kennedy, Mr. Lewis, Mr. Meacham, Mr. Mott, Mr. Nereson, Mr. M. Eugene Smith, Mr. Troutner.

Teacher Education—Dr. Semans, Chairman; Mr. Andrews, Dr. Bowls, Mr. Burlingham, Mr. Cook, Mr. Leach, Mr. McCorkle, Mr. McMahon,† Mr. Mott, Mr. Nereson, Dr. Noble, Mr. Vard Shepard, Dr. Whitson, Mr. Winner.

California Polytechnic Foundation Directors—Mr. McPhee, President; Mr. Merson, Vice President; Mr. C. Jones, Secretary-Treasurer; Mr. Gibson,* Mr. McCorkle, Mr. Wilson, Mr. Zilka.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

† Member of the State Bureau of Agricultural Education with headquarters at California State Polytechnic College, San Luis Obispo, California.

FACULTY COMMITTEES

VOORHIS UNIT

The following faculty committees will serve at the Voorhis campus during the school year 1951-52.

Instructional Council—Mr. Gibson, Chairman; Mr. Batcheller, Mr. Canham, Mr. Englund, Dr. Lamiman, Mr. McGrath, Mr. House.

Alumni Activities—Mr. Moran, Chairman; Mr. Kempton, Mr. Stull, Mr. Procsal.

Campus Development—Mr. Batcheller, Chairman; Mr. Conrad, Mr. Kempton.

Farm Advisory—Mr. Englund, Chairman; Mr. Canham, Mr. Peters, Dr. Stocking, Mr. Batcheller.

Library—Dr. Lamiman, Chairman; Mr. Lint, Mrs. Penley.

Placement—Mr. Appel, Chairman; Mr. Canham, Mr. Batcheller, Mr. Englund.

Student Loans and Scholarships—Mr. Boltz, Chairman; Mr. Aschenbrenner, Mr. House, Mr. Geiger.

Student Welfare and Activities—Mr. House, Chairman; Mr. Boltz, Mr. Lint, Mr. Stull, Mr. Weeks, Mr. Brown, Mr. Griffin, Mr. Hobbs.

FACULTY

MCPHEE, JULIAN A.—B.S., M.A.-----President

B.S. from University of California, 1917; M.A. from University of California, 1928.

Experience: Agriculture Extension Service, University of California; United States Navy; Director of Vocational Agriculture, El Dorado County High School and Gilroy Union High School; Assistant State Supervisor of Agricultural Education (California); Chief, Bureau of Agricultural Education, State Department of Education (California); Director, War Food Production Training Program for California; Chief of Division of Readjustment Education; Assistant Executive Officer, State Board of Vocational Education; State Director of Vocational Education (California).

President, California State Polytechnic College since 1933.

WILSON, HAROLD O.—B.S.-----Executive Dean

B.S. from University of California, 1932; additional study at Fresno State College; graduate study at University of California at Los Angeles.

Experience: Director of Agriculture, Excelsior Union High School, Norwalk; Instructor of Agriculture and head of the Swine Department at California Polytechnic School; Regional Supervisor of Agricultural Education, State Department of Education (California), 1941-1946; Dean of Voorhis Unit, 1946-1950.

At California State Polytechnic College since 1936. (With the exception of time spent with the Bureau of Agricultural Education.)

MCCORKLE, C. O.—B.S., M.S.-----Dean of Instruction

B.S. from University of California, 1927; M.S. from University of California, 1937.

Experience: Director of Agriculture and Critic Teacher, Red Bluff Union High School; Executive Secretary, California Association Future Farmers of America; Assistant Teacher Trainer Agricultural Education, Bureau of Agricultural Education; Head of Agricultural Division, California Polytechnic; Research Assistant on Giannini Foundation of Agricultural Economics, University of California; Instructor Agricultural Economics; Subject Matter Specialist, Bureau of Agricultural Education, State Department of Education (California); Assistant to President, Dean of Instruction, California State Polytechnic College.

At California State Polytechnic College since 1932.

CHANDLER, EVERETT M.—A.B.-----Dean of Students

A.B., University of California, 1939; additional graduate work, University of California.

Experience: Administrative Officer, U. S. Air Matériel Command; Personnel Technician, State Personnel Board; Management Analyst, State Department of Finance; Extension teacher, Sacramento State College; U. S. Air Force, 1944-1946.

At California State Polytechnic College since 1951.

NELSON, DONALD S.—A.B.-----Business Manager

A.B. from Stanford, 1930.

Experience: California State Department of Finance, Budgets, and Accounts; Comptroller, Fresno State College.

At California State Polytechnic College since 1943.

WINNER, C. PAUL—B.S.-----Admissions Officer

B.S. from Montana State College, 1931.

Experience: Utah Construction Company; Director of Vocational Agriculture, Valier High School, Valier, Montana; Director of Vocational Agriculture and Critic Teacher, Elk Grove Union High School; Director of Vocational Agriculture and Critic Teacher, Arroyo Grande Union High School; in charge, Training Records for Cadets in U. S. Naval Flight Preparatory School and for trainees in the Naval Academic Refresher Unit Program; Acting Recorder; Teacher Trainer of Agricultural Education 1946-47.

At California State Polytechnic College since 1940.

SHEPARD, VARD M.—B.S.-----Dean, Agricultural Division

B.S. in Agriculture, University of Minnesota, 1923.

Experience: U.S.D.A. Bureau of Plant Industry, 1923-1924; South St. Paul Union Stockyards Company, 1924-1929; Instructor of Agriculture, Galt High School, 1929-1930; Instructor of Vocational Agriculture, West Side High School, Los Banos, 1930-1932; Head of Animal Husbandry Department, California State Polytechnic College, 1932-1937; Special Representative, South San Francisco & Stockton Union Stockyards, 1937-1940; Manager, Stockton Union Stockyards, 1940-1941; Extension Specialist in Animal Husbandry, University of California, 1941-1947.

At California State Polytechnic College since 1947.

PRIESTLEY, RALPH B.—B.S.-----Dean, Engineering Division

B.S., University of Illinois, 1936.

Experience: Employed 10 years by consulting engineering and architectural firms, Middle West; five years in private practice as architect and consulting engineer, Chicago; head, Architectural Engineering Department, California State Polytechnic College, 1948-1951.

At California State Polytechnic College since 1948.

SEMANS, HUBERT H.—A.B., M.A., Ph.D.-----Acting Dean, Liberal Arts Division

A.B. from Whittier College, 1930; M.A. from the University of Southern California, 1931; Ph.D. from the University of Southern California, 1948.

Experience: Research Fellow, California Bureau of Juvenile Research, 1930-1931. Travel in England, Holland, Germany, Austria, Switzerland, and France, 1934. Teacher and Chairman of Counseling and Guidance at San Luis Obispo Junior High School, 1931-1936; Vice Principal and Supervisor of Instruction at San Luis Obispo Junior High School, 1934-1940; Instructor at San Luis Obispo High School and Junior College, 1936-1940; Principal at Junior High School, San Luis Obispo, 1940-1945; Instructor, English and History in the Naval Academic Refresher Unit and the U. S. Naval Flight Preparatory School.

At California State Polytechnic College since 1945.

* GIBSON, J. CORDNER—B.S.-----Dean of Voorhis Unit

B.S., University of California, 1937.

Experience: Director of Vocational Agriculture, Downey and Whittier Union High Schools; U. S. Army; Regional Supervisor, Bureau of Agricultural Education. At California State Polytechnic College since 1949.

* ENGLUND, CARL R.—B.S.-----Assistant Dean, Voorhis Unit

B.S., University of California at Berkeley, 1939.

Experience: Instructor in Vocational Agriculture, Reedley High School and Junior College, Reedley, California.

At California State Polytechnic College since 1948.

BOERMAN, LEONA M.-----Secretary to President

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

* HOUSE, HENRY—B.S.-----Coordinator of Student Affairs
 B.S., California State Polytechnic College, 1943.
 Experience: Director of Vocational Agriculture, Brawley Union High School, 1946-1947; U. S. Marine Corps, Officer.
 At California State Polytechnic College since 1947.

PHILBIN, LEO F.—B.S.-----Registrar
 B.S. from California State Polytechnic, 1944.
 Experience: Instructor, aircraft, Naval Flight Preparatory School, California Polytechnic; Aircraft instructor, Fourth Airforce Headquarters, San Francisco; Civilian Training Administrator, Salinas Army Air Base, Salinas; Training Officer in Charge, Veterans Administration Office, San Luis Obispo.
 At California State Polytechnic College since 1948.

CAMP, G. MABEL-----Recorder

JONES, JOHN E.—B.S.-----Placement Secretary
 B.S., California State Polytechnic College, 1947; additional study, California State Polytechnic College, 1947-48.
 Experience: Ranching and owner of retail grocery market; Assistant Manager Service Unit, Union Oil Co.; U. S. Navy; Student Manager, Associated Students, California State Polytechnic College.
 At California State Polytechnic College since 1947.

TROUTNER, WILLIAM R.—B.S.-----Supervisor of Resident
 Students and Instructor in Plant Sciences
 Graduated from California State Polytechnic College with Vocational Certificate, 1934; Received B.S., University of California (Davis), 1938.
 Experience: Director of Agriculture, Pomona High School and Junior College; Director of Agriculture and Critic Teacher, San Luis Obispo Senior High School (half-time high school and half-time California State Polytechnic College); In charge of housing for U. S. Naval Flight Preparatory School and Naval Academic Refresher Unit Program; Instructor communications, Naval Flight Preparatory School.
 At California State Polytechnic College since 1942.

ALBAN, LAWRENCE A.—B.S., M.S., Ph.D.-----Soil Science
 B.S., Washington State College, 1943; M.S., Washington State College, 1948; Ph.D., Oregon State College, 1950.
 Experience: Soil Surveyor, Oregon State College; Chemist, Paraffine Co., Inc., Emeryville, California, and Bozeman Canning Co., Ellensburg, Washington; teaching assistant in chemistry, Washington State College; U. S. Army.
 At California State Polytechnic College since 1950.

ALLEN, FRANCIS S.—Litt.B., B.S.-----Head Librarian
 Litt.B., Xavier University, Cincinnati, Ohio, 1933; graduate work at St. Louis University, St. Louis, Missouri, and Loyola University, Chicago, Illinois; B.S. in library science, University of Illinois, 1941.
 Experience: Instructor, English, Latin, St. Ignatius High School, Chicago; librarian, Seattle College, Seattle; officer U. S. Army; librarian, Shrivenham American University, Shrivenham, Berks, England; assistant circulation librarian, Oregon State College.
 At California State Polytechnic College since 1949.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

- †ALGEO, JOHN W.—B.S., M.S.-----Animal Husbandry
 B.S. and M.S., State College of Washington, 1949.
 Experience: Served as officer in U. S. Marine Corps; Graduate Research Assistant, Washington State College.
 At California State Polytechnic College since 1949.
- ANDERSON, CLIFFORD H.—B.S.-----Mechanical Engineering
 B.S., California State Polytechnic College, 1949.
 Experience: Trainee, U. S. Maritime Commission; Fireman-Water Tender, Moore-McCormack Steamship Co., San Francisco; Motor Machinist's Mate, U. S. Navy.
 At California State Polytechnic College since 1949.
- ANDERSON, RICHARD A.—B.S., M.S.-----Physical Education and Athletics
 B.S., University of Southern California, 1942; M.S., University of Southern California, 1947.
 Experience: Playground director, lifeguard, Los Angeles Playground and Recreation Department; officer in U. S. Navy; swimming pool director, South Pasadena; assistant instructor in physical education, University of Southern California.
 At California State Polytechnic College since 1947.
- ANDERSON, ROY E.—B.A., M.A.-----Social Science
 B.A., Pacific Lutheran College, 1942; M.A., Stanford University, 1948. Additional graduate work, Stanford University.
 Experience: Assistant Manager, Hancock Oil Company, Tacoma, Washington; Instructor, Parkland Junior High School, Parkland, Washington; Instructor, Stanley School, Tacoma, Washington; Officer, U. S. Army; Instructor, Monterey Peninsula College, Monterey.
 At California State Polytechnic College since 1949.
- ANDERSON, WARREN R.—B.S.-----Electrical Engineering
 B.S. in Agriculture, University of Minnesota, 1939; B.S., Electrical Engineering, Louisiana State University, 1944.
 Experience: Taught agricultural science in public schools of Windom, Minnesota; Additional training at Central Signal Corps School; Plant Engineering Agency, Philadelphia; Engineering testing bureau of the Automatic Electric Company of Chicago.
 At California State Polytechnic College since 1946.
- ANDREWS, DALE W.—B.S.-----Agricultural Education and Teacher Training
 B.S., University of California, Davis, 1941; Graduate Work, University of California, Davis, and California State Polytechnic College.
 Experience: Director of Agriculture, Merced Union High School; Director of Agriculture and Critic Teacher, Arroyo Grande Union High School, Arroyo Grande; Officer, U. S. Marine Corps.
 At California State Polytechnic College since 1950.
- *APPEL, EDWARD CARL, JR.—B.S.-----Agricultural Inspection
 B.S. at Oregon State College, 1940.
 Experience: Agricultural Inspection, Department of Agriculture, San Bernardino County; Deputy County Agricultural Commissioner; Served in U. S. Navy as an officer, 1944-1946.
 At California State Polytechnic College since 1946.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

† On military leave.

*ASCHENBRENNER, ALBERT—A.B., M.S.-----English
A.B., Whitman College (Washington) 1940; M.S., University of Southern California, 1947; Additional graduate work, Montana University.
Experience: Custer County High School, Miles City, Montana; Infantry School, Fort Benning, Georgia; Served in U. S. Army for four years as an officer.
At California State Polytechnic College since 1947.

† BAILEY, BERNIE B.—B.S.-----Poultry
B.S., Iowa State College, 1947; graduate study, Texas A. & M., 1949.
Experience: Manager, Poultry Farm, North Texas Agricultural College; served in U. S. Army; Poultry Supervisor, Iowa Poultry Improvement Association; Poultry Department Supervisor, Texas A. & M.
At California State Polytechnic College since 1949.

BALCH, ROSCOE K.—B.S., D.V.M.-----College Veterinarian and Poultry Pathology
B.S., Washington State College, 1945; D.V.M., Washington State College, 1947.
Experience: U. S. Army; practice of veterinary medicine, Dayton, Washington.
At California State Polytechnic College since 1948.

BARKER, MARY LOU—A.B., A.B. in L.S.-----Assistant Cataloger
A.B., Nebraska Wesleyan University, 1947; A.B. in Library Science, University of Michigan, 1948.
Experience: Junior cataloger, University of Michigan Law Library.
At California State Polytechnic College since 1950.

*BATCHELLER, OLIVER AMBROSE—B.S.-----Ornamental Horticulture
B.S. from Oregon State College in 1936; Additional graduate work at Oregon State College.
Experience: Assistant Farm Adviser, Oregon; Foreman and salesman, California Nursery Company, California; In charge of Nursery Exhibit World's Fair in San Francisco; Served in the Field Artillery, U. S. Army as a Plans and Training officer, 1941 to 1946.
At California State Polytechnic College since 1946.

BECK, CARL G.—B.S.-----Guidance, Accounting, and Agricultural Economics
B.S. from Colorado State College, 1921. Additional graduate study at Colorado State and University of California at Berkeley and Davis.
Experience: Director of Agriculture, Del Norte Union High School (Colorado); Principal, Del Norte Union High School (Colorado); Director of Agriculture at Middletown Union High School and Colusa Union High School, California; with American Expeditionary Force, Field Artillery, World War I; Instructor mathematics and communications, U. S. Naval Flight Preparatory School; Instructor mathematics, Naval Academic Refresher Unit; Advisor for Poly Royal, 1933—.
At California State Polytechnic since 1932.

BENNION, LYMAN L.—B.S.-----Head of Animal Industries Activities
B.S. from Utah State College, 1929.
Experience: Sales Department Purina Mills; American Packing Company, Union Stockyards, Ogden, Utah; Director of Agriculture, Salinas Union High School; Agricultural Extension Service, University of California.
At California State Polytechnic College since 1938.

BETZ, ELLARD W.—B.A.-----Machine Shop
B.A., Santa Barbara State College, 1942.
Experience: U. S. Navy; teacher of industrial arts, Victor Valley High School, Victorville.
At California State Polytechnic College since 1947.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

† On military leave.

- BILLE, RALPH O.—B.S., M.S.**-----Agricultural Engineering
 B.S., University of Minnesota, 1922; M.S., University of Minnesota, 1940.
 Experience: 16 years as Instructor in Agriculture in secondary schools of Minnesota; instructor in Agricultural Engineering and Industrial Arts, State Teachers College, Platteville, Wisconsin.
 At California State Polytechnic College since 1948.
- BLAIR, HELEN B.—A.B., B.S. in L.S.**-----Head Cataloger
 A.B., Louisiana State University, 1940; B.S. in L.S., Louisiana State University, 1942.
 Experience: Librarian, Covington High School, Covington, Louisiana; cataloger in library, University of Alabama; cataloger, Tulane University, New Orleans; cataloger, University of Texas.
 At California State Polytechnic College since 1948.
- BLOOM, EMMETT A.—B.S.**-----Animal Husbandry
 B.S. from University of California at Davis in Animal Sciences, 1934.
 Experience: Zoology laboratory assistant, University of California; Teacher Vocational Agriculture, Ripon Union High School; Teacher Vocational Agriculture, Layton Joint Union High School; Teacher Vocational Agriculture, Corning Union High School.
 At California State Polytechnic College since 1946.
- *† BOLTZ, HOWARD O.—B.S., M.S.**-----Ornamental Horticulture
 B.S., University of California, 1941; M.S., University of California, 1947.
 Experience: Officer in U. S. Army; landscape architect in private practice; instructor in landscape gardening, Albany Evening High School, Albany, California.
 At California State Polytechnic College since 1947.
- BONGIO, ENRICO P.—A.B.**-----Welding
 A.B., Chico State College, 1948.
 Experience: Electric welder for Chicago Bridge and Iron Company, Eureka, California; U. S. Army; welder and maintenance, Churchill Frozen Foods Company, Eureka; general metal shop work, Woodsman Power Saw Company, Eureka; electric welder, Eureka Boiler Works & Steel Products; shop instructor, Sonoma Valley Union High School, Sonoma, California.
 At California State Polytechnic College since 1948.
- BOWDEN, FREDERICK W.—B.S., M.S.**-----Head, Electrical Engineering
 B.S., California Institute of Technology, 1932; M.S., California Institute of Technology, 1933; additional graduate work, California Institute of Technology.
 Experience: Assistant Operator, Shell Oil Co., Bakersfield; Design Engineer of Electrical Equipment, Oilfields Service, Long Beach; Mechanical and Electrical Consultant, Walt Disney Studios, Burbank; Head of Electrical Research, Lockheed Aircraft Co., Burbank; Associate Professor, University of Southern California, College of Aeronautics, Santa Maria.
 At California State Polytechnic College since 1949.
- BOWLS, WOODFORD E.—A.B., M.A., Ph.D.**-----Head of Physical Science Department
 A.B. at University of California in 1932; M.A. in 1935; and Ph.D. in 1937.
 Experience: Pacific Gas and Electric Company, Maintenance Foreman in summer camps; teaching fellow in physics at University of California; Teaching Assistant in physics at University of California; In charge of the physics program for the U. S. Naval Flight Preparatory School and the Naval Academic Refresher Unit.
 At California State Polytechnic College since 1937.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

† On military leave.

BOYLE, KENNETH D.—B.S.-----Dairy Manufacturing
B.S., University of Minnesota, 1942.

Experience: Butter and ice cream, Neepawa Creamery and Produce Co., Neepawa, Manitoba, and Central Creameries, Brandon, Manitoba; Royal Canadian Air Force; on research staff and foreman in experimental plant for food processing and market milk, Golden State Co., Ltd., San Francisco.

At California State Polytechnic College since 1947.

BOVEE, EUGENE C.—B.A., M.S., Ph.D.-----Biology

B.A., Iowa State Teachers College, 1939; M.S., State University of Iowa, 1948; Ph.D., University of California at Los Angeles, 1950.

Experience: Instructor in Biology, Iowa State Teachers College; Science Instructor, Greene, Iowa, high school; Instructor, medical records, U. S. Army; teaching assistant, University of California at Los Angeles.

At California State Polytechnic College since 1950.

BRENDLIN, GENE E.—B.S.-----Foundation Manager

B.S., University of California, 1934; additional graduate study, University of California.

Experience: Director, Vocational Agriculture, Fallbrook Union High School, Linden Union High School, Tracy Union High School, and Arroyo Grande Union High School from 1935 to 1943; Manager, Brendlin Ranch, San Luis Obispo County; President, Brendlin-Rice and Co., Inc.

At California State Polytechnic College since 1950.

BROMLEY, J. PHILIP—B.S., M.S.-----Economics and Agricultural Economics

B.S. in business education from the University of Southern California, 1936; Additional graduate work, Columbia University, Texas A. & M., and the University of California.

Experience: Taught elementary school, 1934-36; taught commerce, San Diego State College, 1936-1942; Radar officer, U. S. Naval Reserve, 1942-1945; Commerce Instructor, San Diego State College, 1945-1946.

At California State Polytechnic College since 1947.

BROWN, GEORGE M.-----Architectural Engineering

General Contractor, Los Angeles; Designer, W. P. Niel Co., Ltd., Vernon; Chief Draftsman, W. A. Bechtel Co. and Marinship Corp., San Francisco; Chief Draftsman, General Engineering Service Co., Los Angeles; Chief Draftsman and Manager of Appraisal Service, Oakland; Construction Superintendent, H. L. Bryni Co., Encino; Architectural Designer, H. B. Douglas, Architect, San Luis Obispo.

At California State Polytechnic College since 1949.

BROWN, HOWARD—B.S.-----Ornamental Horticulture

B.S. in Agriculture from California Polytechnic in 1943.

Experience: Served in the U. S. Army Air Corps 1943-1946; Assistant Instructor of Ornamental Horticulture at California State Polytechnic College from 1946 to 1947.

At California State Polytechnic College since 1946.

*BROWN, HOWARD S.—B.A., M.A.-----Biological Sciences

B.A., University of California at Los Angeles, 1943; M.A., University of California at Los Angeles, 1948.

Experience: Teaching assistant, University of California at Los Angeles; officer in U. S. Marine Corps.

At California State Polytechnic College since 1948.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

BURLINGHAM, HERBERT H.—B.S.-----Agricultural Education and Teacher Training

B.S., Oregon State College, 1929; graduate work, University of California.

Experience: Director of agriculture, Willits Junior-Senior High School; director of agriculture, Madera Union High School; director of Agriculture and critic teacher, Paso Robles Union High School; four years as regional supervisor, State Bureau of Agricultural Education, California.

At California State Polytechnic College since 1948.

BUSH, WILLIAM E.—A.B., M.A.-----Physical Science and Photography

A.B., University of California, 1930; M.A., University of California, 1932.

Additional graduate work, University of California.

Experience: Research Physicist, Manhattan Project-Industrial High Vacuum Research, Radiation Laboratory, University of California; Engineer, Designs, Richmond Refinery-Standard Oil Co., California; Instructor of Physics, Engineering and Technical Photography, San Francisco City College; Instructor of Physics, University of California Extension Division; Instructor, Physics and Chemistry of Photography, University of California.

At California State Polytechnic College since 1949.

BUTZBACH, ARTHUR G.—A.B., M.A., Ed.D.-----Education and Psychology

A.B., Stanford University, 1926; M.A., Stanford University, 1928; Ed.D., Stanford University, 1948.

Experience: Teacher and principal, Lower Lake Union High School, 1928-1946; Assistant Professor of Education, Drake University, 1947-1949, and Sacramento State College, 1949-1950.

At California State Polytechnic College since 1950.

CAMPBELL, ERLE SIMS-----Agricultural Mechanics and Farm Superintendent

Experience: Farm superintendent for California Packing Corporation on peach, prune, and plum orchards and vineyards; Farm superintendent for John Treanor on prunes, pears, and wine grapes; Past 16 years superintendent of beef cattle, hog, sheep, hay and grain on Lake County Ranch.

At California State Polytechnic College since 1947.

*CANHAM, ALBERT E.—B.S.-----Citrus Fruit Production

B.S., University of California at Los Angeles, 1941.

Experience: Officer in U. S. Navy; manager of avocado and citrus grove; manager and owner of commercial weed and pest control company; instructor of Veterans Palomar College, Vista, California.

At California State Polytechnic College since 1948.

*CANTON, RAY T.—B.A.-----English, Journalism, Public Speaking

B. A., Whittier College, 1941.

Experience: Publicity writer, Vultee Aircraft Corp.; U. S. Army, 1941-45; sports editor, *Alhambra Post-Advocate*, Alhambra; sports writer, *Press-Telegram*, Long Beach, and *Los Angeles Mirror*.

At California State Polytechnic College since 1951.

*CARLBERG, GEORGE E.—B.S.-----Agricultural Economics

B.S., University of California, 1946; graduate study at University of California at Los Angeles.

Experience: Livestock Buyer, Armour & Co.; Field Artillery Officer, U. S. Army; Field Man, Arden Farms Co.

At California State Polytechnic College since 1949.

CARRINGTON, JAMES H.-----Machine Shop

Special Vocational Arts Credential, University of California, Los Angeles, 1940; Special Vocational Arts Credentials, University of California, Berkeley, 1941 and 1942.

Experience: Auto Mechanic, Los Molinos Garage, Los Molinos; Auto Shop Instructor, Los Molinos High School, Los Molinos.

At California State Polytechnic College since 1943.

* Located at the Voorhls Unit of California State Polytechnic College at San Dimas, California.

CARTER, LOGAN SAMPSON—B.S., Ph.D.-----Soils
 B.S., Oregon State College, 1930; Received Ph.D., Michigan State College, 1934.
 Experience: Instructor in Soils, Michigan State College, 1930-1934; U. S. Department of Agriculture Soil Conservation Service, new employee training, 1934-1939; Author of numerous publications on chemical and biological changes in soils and soil conservation.

At California State Polytechnic College since 1947.

CLAY, HENRY P.—B.S.-----Agricultural Engineering
 B.S. in Agriculture, Michigan State College, 1929; one year test course with General Electric Company.

Experience: Taught tractor and truck short course at Michigan State College; Research with the United States Department of Agriculture; 11 years teaching experience at Texas Technological College; Associate Professor of Agricultural Engineering at Texas Technological College, Lubbock, Texas.

At California State Polytechnic College since 1946.

COLLINS, SPELMAN B.—B.S.-----Sheep Husbandry
 B.S., University of California, 1925.

Experience: Engaged in range sheep business both as foreman and owner: Director of Agriculture, Middletown, Calistoga, and Livermore high schools; instructor aero engines, U. S. Naval Flight Preparatory School; instructor mathematics, Naval Academic Refresher Unit.

At California State Polytechnic College since 1940.

*CONARD, HAVAN Q.—B.S.-----Agricultural Mechanics
 B.S., Iowa State College in Agricultural Engineering, 1943.

Experience: Taught in Engineering Department, Iowa State College, 1945 and 1946; served as an aircraft armament officer in the U. S. Armed Forces 1943-45.

At California State Polytechnic College since 1946.

CONKLING, ROBERT J.-----Welding
 Three years at California State Polytechnic College, majoring in Mechanical Engineering, with minor in Welding.

Experience: Instructor's Aid, San Fernando High school; in charge of Base Repair and Maintenance Shop in U. S. Army; summer employment as journeyman welder for various southern California contractors; part-time welding instructor California State Polytechnic College.

At California Polytechnic College since 1949.

COOK, DAVID W.—B.S.-----Mathematics and Electrical Engineering
 B.S., University of California, 1937.

Experience: Examiner Board of Fire Underwriters of the Pacific; Engineer, Insurance Company of North America; taught navigation in U. S. Naval Flight Preparatory School and acted as head of the Mathematics Department for the Naval Academic Refresher Unit and U. S. Naval Flight Preparatory School.

At California State Polytechnic College since 1941.

CRUIKSHANKS, ANDREW N.—A.B., M.A.-----Head, Social Science Department
 A.B., University of California, 1931; M.A., Stanford University, 1933.

Experience: Sacramento High School, instructor in social studies, 1933-1936; Fort Bragg Schools, social studies and economics, 1936-1947; extensive experience in evening school work covering international relations and community forums.

At California State Polytechnic College since 1947.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

CULBERTSON, GUY K.-----Printing

Experience: Since 1931 journeyman printer, composing room foreman, Deadwood, South Dakota, Santa Monica and Venice, California; member of committee directing on-the-job apprentice training for International Typographical Union in Southern California.

At California State Polytechnic College since 1947.

DAVIDSON, HAROLD P.—B.S., M.A.-----Chairman of Music Department

B.A., Pomona College, 1929; M.A., Claremont College, 1932; additional graduate work, University of Southern California.

Experience: Director of All-City Pomona P.T.A. Chorus; Head of Music Department, Emerson Junior High School, Pomona; Master Training Teacher, Claremont Colleges; taught English in U. S. Naval Flight Preparatory School and the Naval Academic Refresher Unit.

At California State Polytechnic College since 1936.

DEAN, ARNOLD M.—B.S., M.S., Ph.D.-----Soils

B.S., University of Alberta, Canada, 1943; M.S., University of Alberta, Canada, 1946; Ph.D., University of Wisconsin, 1949.

Experience: Laboratory Assistant, Dominion Department of Agriculture, Edmonton, Alberta; Teaching Assistant, University of Wisconsin; Industrial Fellowship, University of Wisconsin.

At California State Polytechnic College since 1949.

DEUEL, J. C.-----Housing and Student Employment

Experience: U. S. Army, Commissioned officer rank of Major; served in Cuba, Panama, Mexico, France, and Germany. Granted leave of absence from California Polytechnic, February 10, 1942, to September 1, 1945, to serve in U. S. Army. Was discharged September 1, 1945, with rank of Major.

At California State Polytechnic College since 1920.

DILTS, RALPH W.—A.B., M.A.-----Political Science and History

A.B. from Montana State University in history, 1936; M.A. in history and political science, Montana State University, 1938; additional graduate work at Montana State University and University of California.

Experience: Instructor secondary school at Stevensville, Montana; Assistant at Montana State University; Assistant at University of California; three years' experience with Bureau of Reclamation under Department of Interior; Instructor at Naval Academic Refresher Unit, California Polytechnic, 1944-46.

At California State Polytechnic College since 1946.

*DIMITMAN, JEROME E.—B.S., M.S.-----Plant Pathology

B.S., University of California at Berkeley, 1943; M.S., University of California, Citrus Experiment Station, Riverside, 1949.

Experience: Citrus production, University of California at Los Angeles; Assistant Plant Pathologist for California State Department of Agriculture; Officer, U. S. Navy.

At California State Polytechnic College since 1949.

DOUGHERTY, PAUL—B.S.-----Head of Field, Fruit, and Truck Crops Department

B.S. from University of California, 1914

Experience: Farm Advisor Imperial County; Farrier, United States Army; Supervisor Advanced Registry Dairy Tests, University of California; Manager Modesto Fruit Exchange; managed and operated own ranch; Director of Agriculture, Washington Union High School, Centerville; Instructor Communications in U. S. Naval Flight Preparatory School.

At California State Polytechnic College since 1939.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

DRUMM, GEORGE M.—B.S., M.A.-----Head of Dairy Husbandry and Dairy
Manufacturing Department

B.S., Kansas State College, 1921; M.S. from Iowa State College, 1922.

Experience: Instructor of Dairying, University of California; Herdsman for numerous commercial dairy farms; Farm Manager, Ranch Del Monte, Carmel, and Patrick Farms, Salinas; Official judge of Jersey, Guernsey, and Holstein-Friesian cattle.

At California State Polytechnic College since 1931.

DUNN, JOHN E.—B.S.-----Agricultural Engineering

B.S., Oregon State College, Corvallis, Oregon, 1943.

Experience: Officer in U. S. Navy; service salesman, Auto Sales Company, Colfax, Washington; maintenance superintendent, California Packing Corporation, Toppenish, Washington; serviceman, J. A. Freeman & Son, Portland, Oregon; testing engineer and service representative, R. M. Wade & Company, Portland, Oregon.

At California State Polytechnic College since 1948.

ECKERT, KERMIT W.—B. of E.-----Electrical Engineering

B. of E., University of Toledo, Toledo, Ohio, 1942; additional graduate work at University of New York State, Troy, New York, and Rensselaer Polytechnic Institute, Troy, New York.

Experience: Draftsman, Owens-Illinois Can Co., Toledo, Ohio; Maintenance Engineer, General Electric Co., Fort Wayne Indiana; Radar Officer, U. S. Navy; Instructor Veterans Vocational School, Troy, New York.

At California State Polytechnic College since 1949.

ELLIS, GERALD E.—A.B.,-----Architectural and Engineering Drafting

A.B., Santa Barbara State College, 1943.

Experience: Architectural draftsman with industrial contractors for two years; served in U. S. Navy as a commissioned officer, 1943-1946.

At California State Polytechnic College since June, 1946.

ELSTON, CHARLES A.—A.B., M.S.-----Mathematics

A.B., Santa Barbara State College, 1932; M.S. from University of Southern California, 1940.

Experience: Eight years teaching in elementary schools, Santa Barbara County, 1934-1942; Instructor of arithmetic and mechanical drawing, Head of Mathematics Department, San Luis Obispo Junior High School, 1942-1947; Instructor of mathematics, Adult Evening School, San Luis Obispo, 1942-1947; Field experience in surveying with the U.S.E.D. and the Southern Pacific Company.

At California State Polytechnic College since 1947.

ESSIG, FREDERICK MONROE—A.B., Ph.D.-----Biological Science

A.B., University of California, 1917, and Ph.D., University of California, 1920; additional graduate study at the University of Southern California for B.D.

Experience: Seven years teaching experience, Ashbury College, Kentucky, and University of California, Los Angeles; 40 months Army service World War II as chaplain.

At California State Polytechnic College since 1946.

FAIRES, JANE L.—B.A., M.S.-----Periodicals Librarian

B.A., University of Redlands, 1947; M.S. in Library Science, University of Southern California, 1949.

Experience: Student Assistant, Santa Ana Junior College Library; Librarian, Headquarters, Orange County Free Library, Santa Ana.

At California State Polytechnic College since 1949.

FELLOWS, ALBERT MELVIN-----Head of Printing Department

Special training courses in Journalism, Advertising, Mechanical Art and Print Shop Management; served in the U. S. Army in World War I; journeyman printer and supervisor of apprentice training programs for 30 years; superintendent of printing plants in Kansas City, Kansas, and Birmingham, Alabama.

At California State Polytechnic College since 1946.

FISHER, CLYDE P.—A.B., M.A.-----Mathematics

A.B., University of Oklahoma, 1942; M.A., University of Southern California, 1947.

Experience: Instructor, Oklahoma University, one year; served in U. S. Army, 1942-1945, instructor in mathematics, gunnery, and survey; teaching assistant, mathematics, University of Southern California, 1946-1947.

At California State Polytechnic College since 1947.

FOLSOM, V. A.—B.S., M.S.-----Mathematics and Physics

B.S. in physics, Iowa State College in 1934; M.S. in physics from Colorado University, 1937; additional graduate work in mathematics at Southern Methodist University.

Experience: Seven years secondary school and junior college teaching experience in California; served as commissioned officer in U. S. Navy, 1943-1946; Assistant Professor of Mathematics at Southern Methodist University.

At California State Polytechnic College since 1946.

GARTER, MORRIS GERALD—A.B., A.M.-----English and Visual Aids Education

A.B. Degree, Western State Teachers College, 1937; A.M., University of Michigan, 1947.

Experience: Instructor in Michigan High Schools, mathematics, history, English, economics, 1931-1937; Instructor in economics, history and government, Durand High School, 1937-1942; Engineer, Willow Run Bomber Plant, 1942-1945; general aeronautical mechanics, U. S. Navy, 1945-1947.

At California State Polytechnic College since 1947.

GOLD, MARCUS—B.A., B.L.S.-----Audio-visual Librarian

B.A., University of California, 1942; B.L.S., University of California, 1947.

Experience: U. S. Army; cataloging assistant, University of California Library.

At California State Polytechnic College since 1947.

GOULD, NORMAN S.—B.A., M.S.-----Education and Psychology

B.A., Pomona College, 1948; M.S., University of Southern California, 1949.

Experience: Instructor, basic medical sciences, U. S. Army; assistant to Counselor of Men, University of Southern California.

At California State Polytechnic College since 1950.

GRANT, DAVID M.—B.A., M.A.-----Chairman, English Department

B.A., Iowa State Teachers College, 1935; M.A., University of Iowa, 1940; additional graduate study, Stanford University.

Experience: Instructor of English and Speech in public high schools in Iowa, 1935-1941; chairman, Department of Speech, Hastings College, Hastings, Nebraska, 1941-1944; officer in U. S. Navy, 1944-1947; Instructor, Stanford University, 1948-1950.

At California State Polytechnic College since 1950.

GRAVES, THEODORE G.—B.A.-----Air Conditioning and Refrigeration

B.A., Humboldt State College, 1940; graduate work, Santa Barbara College.

Experience: Instructor in wood shop, Paia School, Paia, Maui, T. H.; instructor in general metal, Maui High School, Maui, T. H.; teacher at large in drafting and wood shop, San Francisco; lecturer in metal shop, Santa Barbara College.

At California State Polytechnic College since 1947.

GRAY, STANTON—B.S.-----Crops and Fruits

B.S., University of California, 1930.

Experience: Reared on diversified farm; Agricultural instructor at Kingsburg Joint Union High School, Hamilton City High School, and Corning Union High School; Instructor at California State Polytechnic College, Voorhis Unit, three years; Instructor at Yuba City Union High School; Three years' experience with fruit farms and fruit canning companies, 1943-1946.

At California State Polytechnic College 1940 to 1943 and since 1946.

GREEN, GEORGE H.—B.S., M.S.-----Air Conditioning and Refrigeration

B.S. in Mechanical Engineering, University of Saskatchewan, 1944; M.S. in Mechanical Engineering, University of Illinois, 1949.

Experience: Served as officer in Canadian Army (Royal Canadian Electrical and Mechanical Engineers); Lecturer, Thermodynamics, University of Saskatchewan; Research Assistant, University of Illinois.

At California State Polytechnic College since 1949.

GREGORY, C. HEROLD-----Printing

Graduate, Modesto Junior College, 1931; additional study, University of California at Los Angeles and Oklahoma A. & M.

Experience: Superintendent, Chancey-Citizen Co., Beverly Hills, 1934-1942; manager, printing department, Grimes-Stassforth Stationery Co., Los Angeles, 1942-1950; U. S. Navy, 1943-1945.

At California State Polytechnic College since 1950.

*GRIFFIN, JAMES M.—B.S.-----Ornamental Horticulture

B.S. in Ornamental Horticulture from California Polytechnic in 1949.

Experience: Instructor, Institutional On-the-Farm Training Program; landscape and nursery business, San Diego; Studio Greensman, Hollywood; served in Army Air Corps.

At California State Polytechnic College since 1949.

GUSTAFSON, LESTER W.—B.S.-----Head of Aeronautical Engineering Department

B.S. Degree in aeronautical engineering, University of Minnesota, 1932; completed additional graduate study, University of Minnesota, 1933.

Experience: Assistant to Professor in experimental engineering laboratory, University of Minnesota, 1933-1935; Experimental and development engineering on internal combustion engines, Minneapolis-Moline Implement Company, 1935-1937; Experimental and development engineering with Tropic Air Corporation of Chicago, 1937-1939; Aerodynamics engineering, Lockheed and Vega Aircraft Corporations, 1939-1945; Hughes Aircraft Company, 1945-1947.

At California State Polytechnic College since 1947.

HALL, RICHARD-----Aeronautical Engineering

Graduate of California State Polytechnic College, 1939; holds Civil Aeronautics Authority Aircraft and Engines certificate and Ground School certificate.

Experience: Aircraft mechanic at Lockheed Aircraft in Burbank, and Hancock College of Aeronautics, Santa Maria, 1939-1940; Mechanic, Sacramento Air Depot on aircraft and aircraft engines, 1940-1946; Received training on Packard built Rolls Royce aero engines, 1942; and Allison aircraft engines, 1944.

At California State Polytechnic College since 1947.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

HAMMITT, LEWIS E.—B.S., M.A.-----Physics
 B.S. in physics, Whitman College (Washington) 1926; M.A., University of Washington, 1940.

Experience: Taught mathematics, physics, and chemistry at Mabton, Washington, and Longview, Washington; Officer and qualified Naval Air Navigator, U. S. Navy, 1942-1946.

At California State Polytechnic College since 1946.

HARDEN, F. SHELDON—A.B.-----Physical Education and Athletics
 B.A., University of Santa Clara, Santa Clara, California, 1943; graduate work at College of Pacific and Sacramento State College.

Experience: Officer in U. S. Army; player-coach, Sacramento Nuggets.

At California State Polytechnic College since 1948.

HARDGROVE, THOMAS H.—B.M.E.-----Head, Maintenance Engineering
 B.M.E., New York University, 1938; graduate work, New York University.

Experience: Assistant plant engineer, Lederle Laboratories of American Cyanamid Co., Pearl River, New York; field service engineer, Sperry Gyroscope Co., Brooklyn, New York; plant engineer, International Nickel Co., Bayonne, New Jersey; assistant plant engineer, Stewart Warner Co.

At California State Polytechnic College since 1947.

HARDY, JOHN A.—B.S., M.S.-----Chemistry
 B.S., North Dakota Agricultural College, 1932; M.S., University of Minnesota, 1940; additional work at California Institute of Technology; additional graduate work at University of Minnesota.

Experience: Principal and instructor, science and mathematics, Belfield High School, Belfield, North Dakota; instructor and principal, Regent High School, Regent, North Dakota; superintendent of schools, Forbes, North Dakota; chemistry instructor, Hibbing Junior College, Hibbing, Minnesota; mathematics instructor, Berkeley High School; instructor, University of California extension division.

At California State Polytechnic College since 1949.

HAROLDSON, HUGH W.—B.S.-----Mechanical Engineering
 B.S., University of California, 1939; graduate work, University of California.
 Experience: Draftsman, Southern Pacific Co., seven years as marine engineer, U. S. Maritime Commission.

At California State Polytechnic College since 1947.

HASSLEIN, GEORGE J.—B. of Arch.-----Architectural Engineering
 B. of Arch., University of Southern California, 1945.

Experience: Architectural Draftsman, Leeds, Hill, Barnard & Jewett, Engineers, Santa Maria; Senior Draftsman, Airport Design, War Department, Los Angeles; Senior Draftsman, Pan American Highway, War Department, Central America; Group Leader, Gilfillan Brothers Radar, Los Angeles; Designer, Sumner Spaulding, Architect, Los Angeles; Designer, Russell & Samaniego, Architects, Los Angeles; Designer, Wurdeman & Bechet, Los Angeles; Chief Designer, Kistner, Curtis & Wright, Los Angeles.

At California State Polytechnic College since 1949.

HATFIELD, RUFUS C.—B.S., M.A., Ph.D.-----Biological Science
B.S., University of Dayton, Ohio, 1941; M.A., University of California, 1947;
Ph.D., University of California, 1950.

Experience: Chemist, Research Division, National Cash Register Co., Dayton, Ohio; served in U. S. Navy; Teaching Assistant, University of California, Los Angeles. At California State Polytechnic College since 1949.

HEALEY, JOHN R.—B.A.-----Journalism and Publications

B.A., San Jose State College, 1941.

Experience: Reporter, San Jose News; public relations, McClellan Field, Sacramento; reporter, Sacramento Union; Valley editor, Modesto Bee.

At California State Polytechnic College since 1947.

HIGHUM, ORVIE—B.S., M.S.-----Air Conditioning and Refrigeration

B.S., University of North Dakota, 1934; M.S., University of Southern California, 1949.

Experience: Rodman, State Highway Department, Grand Forks, North Dakota; junior engineer, F. E. R. A. and Bureau of Biological Survey, Bismarck, North Dakota; instructor, University of North Dakota; clerk, salesman, assistant sales promoter, Standard Oil Company, Minot, North Dakota and Green Bay, Wisconsin; officer in U. S. Army; design engineer, Riverside Cement Company, Riverside, California; engineer, C. F. Braun & Company, Alhambra, California; registered professional mechanical engineer, State of California.

At California State Polytechnic College since 1948.

*HOBBS, KENNETH R.—B.S., M.A.-----Agricultural Inspection

B.S., Botany, Oregon State College, 1946; M.A., Entomology, Oregon State College, 1948.

Experience: Instructor, U. S. Army Air Force; Technician, Curator, and Part-time Instructor, Department of Entomology, Oregon State College; Agricultural Inspector, Los Angeles County Department of Agriculture; State Nursery Inspector, State Department of Agriculture.

At California State Polytechnic College since 1950.

HOLMQUIST, ROBERT E.—B.A., M.A.-----Physics

B.A., University of Oregon, in physics, in 1932; M.A., physics, Oregon State College, 1936; Additional graduate work, Purdue University and University of Washington.

Experience: Teaching assistant in physics, University of Oregon, and Oregon State College; instructor at University of Oregon; teaching fellow at Purdue University; teaching fellow, University of Washington and supervised teaching in high school at Seattle; inspection supervisor, Boeing Aircraft Company, 1941-1945.

At California State Polytechnic College since 1946.

HOOVER, RALPH W.-----Animal Husbandry and Agricultural Mechanics

Experience: Instructor in horseshoeing and blacksmithing, U. S. Army; Horse-shoer, Porterville, California.

At California State Polytechnic College since 1948.

HOOVER, ROBERT F.—B.A., M.A., Ph.D.-----Botany and Biological Sciences

B.A., Stanford University, in botany in 1934; M.A. in botany, University of California, 1935; and Ph.D., University of California, 1937.

Experience: Teaching assistant, University of California; Instructor, Yakima Valley Junior College; Taught botany, zoology, and physiology. Officer Army Medical Corps, 1942-1946.

At California State Polytechnic College since 1946.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

HOUE, A. L.—B.S., M.S., Ph.D.-----Chemistry
 B.S., Michigan State College, 1926; M.S., Michigan State College, 1928; Ph.D., Pennsylvania State College, 1933.

Experience: Chemistry instructor, Michigan State College; Chemistry instructor, Pennsylvania State College; Research chemist for the Rohm and Haas Company, Philadelphia, Pennsylvania, working on textile-treating agents and cellulose derivatives.

At California State Polytechnic College since 1946.

HOWES, WILBUR B.—B.A.-----Head of Ornamental Horticulture Department
 Non-degree work at University of California, Davis; Received B.A., Chico State College, 1930; Additional graduate study, University of Southern California and Cornell University.

Experience: Instructor in Agriculture, Los Angeles School System.

At California State Polytechnic College since 1932.

HOYT, LYLE SAFLEY—B.S.-----Animal Husbandry
 B.S., Iowa State College, 1941; Additional graduate study, South Dakota State College.

Experience: County Club Agent and County Agricultural Agent in Iowa, 1942; Instructor Animal Husbandry Department, South Dakota State College; Served in U. S. Army as an officer, 1942-1945.

At California State Polytechnic College since 1946.

HUGHES, LEROY BARRY—B.S., M.A.-----Director of Athletics
 B.S., University of Oregon, 1931; M.A., Stanford University, 1950.

Experience: Physical Education Teacher and Coach, Monterey High School; Head Athletic Coach, Menlo Junior College; Substitute Teacher, San Francisco School Board; Sporting Goods Salesman, E. B. Thurber Co., San Francisco; served as officer in U. S. Navy.

At California State Polytechnic College since 1950.

HUNTER, GEORGE H.—B.A., B.A. in L.S.-----Assistant Reference Librarian
 B.A., University of Washington, 1948; B.A. in Library Science, University of Washington, 1950.

Experience: Reference Department and Science Department, University of Washington Library; served in U. S. Marine Corps.

At California State Polytechnic College since 1950.

JENSEN, JAMES J.—B.A., M.A.-----Physical Education and Athletics
 B.A., Washington State College, 1935; M.A., Stanford University, 1941.

Experience: Coach and instructor of social science, Shelton High School, Shelton, Washington, and Santa Rosa High School, Santa Rosa, California; coach and dormitory supervisor, Menlo Junior College, Menlo Park, California; coach of track and instructor in hygiene, San Francisco Junior College; officer in U. S. Navy.

At California State Polytechnic College since 1948.

JOHNSON, RICHARD F.—B.S., M.S.-----Animal Husbandry
B.S., Iowa State College, 1942; M.S., State College of Washington, 1947.

Experience: Officer, U. S. Army; Instructor, College of Agriculture and Assistant Animal Husbandman, Experiment Station, State College of Washington, Pullman, Washington.

At California State Polytechnic College since 1950.

JOHNSTON, ROBERT M.—A.B.-----Engineering Drafting
A.B. in Industrial Arts, Santa Barbara State College, 1937; Graduate of the Boeing School of Aeronautics in meteorology, 1938.

Experience: Taught meteorology and weather forecasting, preparation of weather maps, Randolph Officer Training School; Airline Meteorologist for Pan-American Airlines, 1941-1946.

At California State Polytechnic College since 1946.

JORGENSEN, EDWARD J.—B.A.-----Physical Education and Athletics
B.A., Chico State College, 1936; graduate work, San Jose State College and University of California.

Experience: Instructor of physical education and industrial arts, South Fork High School, Ferndale High School, and Watsonville High School; athletic director, Marin Junior College; officer in U. S. Navy.

At California State Polytechnic College since 1947.

*KATTENHORN, ALBERT E.—B.S.-----Agricultural Mechanics
B.S., University of California at Davis, 1935.

Experience: Teacher in agriculture, Point Arena Union High School, Julian Union High School, and Escondido Union High School, California.

At California State Polytechnic College since 1948.

KENNEDY, ROBERT E.—A.B., M.A.-----Journalism and Publications
A.B., San Diego State College, 1938; M.A., Stanford University, 1950.

Experience: Publicity director, San Diego State College; reporter, *San Diego Sun*, Scripps-Howard paper; executive secretary and publicity manager, Civic Affairs Conference, San Diego; advertising manager, Hamilton's, Ltd., San Diego; reporter-photographer, *San Diego Daily Journal*; editorial staff, *Telegram-Tribune*, San Luis Obispo; reporter and radio news editor, *Palo Alto Times*, Palo Alto; instructor, communications and English, U. S. Naval Flight Preparatory School and Naval Academic Refresher Unit.

At California State Polytechnic College since 1940.

†KENNELLY, BRUCE—B.S., M.A.-----Chemistry
B.S., University of Kentucky, 1944; M.S., Purdue University, 1946; additional graduate work, Purdue University.

Experience: Staff member, department of agricultural chemistry, Purdue University, 1944-1947.

At California State Polytechnic College since 1947.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

† On educational leave.*

KITCH, KENNETH H.—A.B., A.M.-----Head, Agricultural Journalism
A.B., Southwestern College, 1930; A.M., Kansas University, 1937.

Experience: Reporter, *El Dorado Times*, El Dorado, Kansas and *Winfield Courier*, Winfield, Kansas; Sports Editor, *Manhattan Mercury*, Manhattan, Kansas; Assistant Advertising Manager and City Editor, *Great Bend Tribune*, Great Bend, Kansas; Instructor, Rural High School, Arlington, Kansas; Instructor, Altamont High School, Altamont, Kansas; Correspondent for *Kansas City Star*, and editorial columnist for chain of southeast Kansas weeklies; Instructor, Dallas Technical High School, Dallas, Texas; relief editor and writer, Associated Press, Dallas Bureau; Assistant Director, Dallas Adult Education Program, Dallas, Texas; Supervisor Promotion Board, North American Aviation, Dallas, Texas; Editor and Managing Editor, *Southern Seedsman* and *Sun-Up* Magazines, San Antonio, Texas.

At California State Polytechnic College since 1950.

KNOTT, C. E.—B.S., M.S.-----Electrical Engineering
B.S., University of California, 1916; M.S., University of California, 1917.

Experience: Apprentice Machinist at Pomona Manufacturing Company; Substation Operator for Pacific Gas & Electric Company, Berkeley; U. S. Army Overseas, World War I; Evaluation of Power Plants and Substations for Pacific Gas & Electric Company, San Francisco; At California Polytechnic, instructor in industrial department; Instructor, navigation, U. S. Naval Flight Preparatory School, and physics in the Naval Academic Refresher Unit.

At California State Polytechnic College since 1921.

* LAMIMAN, JOHN F.—B.S., M.S., Ph.D.-----Agricultural Inspection and Entomology
B.S. in entomology, University of California, 1922; M.S. in entomology, University of California, 1924; Ph.D., in entomology, University of California, 1931.

Experience: Research Assistant, University of California, Entomologist in Experiment Station; Instructor at University of California.

At California State Polytechnic College since 1946.

LANDER, J. ROLLIN—B.S.-----Animal Husbandry
B.S., Iowa State College in animal husbandry, 1941, after having attended California Polytechnic.

Experience: Employed by Tudor Orchards, Yuba City; Frank Cornell Ranch, Salinas; Teacher of Veterans—Agricultural courses, Gonzales Union High School.

At California State Polytechnic College since 1946.

LANE, MARGARET M.—B.A., B.L.S.-----Assistant Cataloger
B.A., Santa Barbara College, 1947; B.L.S., School of Librarianship, University of California, Berkeley, 1948.

Experience: Library Assistant, Library of the Santa Barbara Museum of Natural History; Acquisition Assistant, Biomedical Library, University of California, Los Angeles.

At California State Polytechnic College since 1949.

LANG, CHARLES H.—B.S., M.A.-----English
B.S., University of Minnesota, 1947; M.A., University of Minnesota, 1949; additional graduate work, University of Minnesota.

Experience: English teacher and coach, Sault Ste. Marie, Michigan; high school and Western Military Academy, Alton, Illinois; enlisted man and officer, U. S. Army Air Force, 1942-1946.

At California State Polytechnic College since 1950.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

LEACH, RICHARD—B.S.-----Head of Poultry Husbandry Department
B.S., Montana State College, 1931.
Experience: Supervisor, feed sales agency for Sweet & Company, Bozeman, Montana; Manager and owner of commercial poultry plant, Bozeman, Montana.
At California State Polytechnic College since 1930.

LEARY, WILLIAM GORDON—A.B., M.A.-----English
A.B., 1936, and M.A., 1938, University of California at Los Angeles; additional graduate work at the University of Washington and the University of Chicago.
Experience: Teaching assistant, University of California at Los Angeles, 1936-37; Instructor of English, Kern County Union High School, Bakersfield, 1938-41; Instructor, University of Washington, 1941-42; U. S. Navy, 1942-45.
At California State Polytechnic College since 1947.

LEWIS, VANCE D.—A.B., M.A.-----Mathematics and Physics
A.B., 1933, and M.A., 1940, University of California. Additional graduate work University of California and University of Miami.
Experience: California secondary school administrator, 1934-43; U. S. naval aviation officer, 1943-46.
At California State Polytechnic College since 1946.

*LINT, HAROLD L.—B.A., M.A.-----Biological Sciences
B.A., University of California at Los Angeles, 1940; M.A., University of California at Los Angeles, 1942.
Experience: Five years as inspector for U.S. Food and Drug Administration.
At California State Polytechnic College since 1947.

LONBORG, REYNOLD H.—B.S.-----Truck Crops
B.S. in agriculture, University of California, 1932.
Experience: Instructor of Vocational Agriculture, Downey Union High School, Downey, California, 1934-1936; Director of Department of Vocational Agriculture at Santa Maria Union High School, Santa Maria, California, 1936-1946. Two years experience in vegetable production in the Santa Maria Valley.
At California State Polytechnic College since 1946.

MCGRATH, JAMES—B.A.-----Guidance and Air Conditioning and Refrigeration
Attended California Polytechnic 1935-1938; received B.A., Santa Barbara State College, 1941; additional graduate work at Claremont College.
Experience: Steam Engineer, license unlimited 1935 to date; Lieutenant Commander, Engineering Officer; First Assistant Engineer, U. S. Army Transport S. S. YuSang; U. S. Army on Bataan. Extensive travel in Pacific area—Japan, China, Malay, Manchuria, Korea, Philippines, and Borneo.
At California State Polytechnic College since 1946.

*MCGRATH, THOMAS H.—B.A., M.A.-----Curriculum Coordinator, Psychology
B.A., Santa Barbara State College, 1941; M.A., Claremont Graduate School, 1946; doctoral candidate, Claremont Graduate School.
Experience: Senior instructor, Air Force Instructors' Technical School, Chanute Field, Illinois; teacher of industrial arts, Los Angeles City Schools; graduate assistant in school administration, Claremont Graduate School; curriculum specialist, State Department of Education, Division of Secondary Education; instructor of psychology and dean of men, Mt. San Antonio College, visiting lecturer in Audio-Visual Education, Claremont Graduate School.
At California State Polytechnic College since 1949.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

McNEELY, GEORGE H.—B.S.-----Animal Husbandry
 B.S., University of California at Davis, 1948.
 Experience: Teaching assistant and reader, University of California at Davis;
 laborer, Flying Three Ranch, Walnut, California; officer in U. S. Army Air Corps.
 At California State Polytechnic College since 1948.

McRAE, LAURA L.—A.B., M.S.-----Assistant Circulation Librarian
 A.B., San Jose State College, 1948; M.S., School of Library Service, Columbia
 University, 1949.
 Experience: Shell Development Company, Emeryville; medical laboratory, U. S.
 Army, Tucson, Arizona; student assistant, San Jose State College Library.
 At California State Polytechnic College since 1949.

MAGER, HANS—M.S.-----Architectural Engineering
 M.S. and C.E., The Royal University of Technology, Stockholm, Sweden, 1947.
 Experience: Designer of Reinforced Concrete, Cement Works, Port Kunda,
 Estonia; Designer of Highway Bridges and Administrator, Estonian Highways,
 Estonia; Lecturer, Railway Engineering School, Estonia; Constructor of Railway
 Bridges, Administration of Estonian Railways, Tallinn, Estonia; Structural Engineer,
 Building Concern H. S. B., Stockholm, Sweden.
 At California State Polytechnic College since 1949.

MARSTON, ENA LESLIE—B.A., M.A.-----English
 B.A., Mills College, 1927; M.A., Mills College, 1928; M.A., Radcliffe College,
 1931; additional graduate work at the Universities of California, Washington, and
 Chicago.
 Experience: High school teaching at Abbot Academy, Andover, Massachusetts;
 Concord Academy, Concord, Massachusetts. College teaching at St. Helen's Hall Junior
 College, Portland, Oregon; Washington State College, Administration as Registrar at
 St. Helen's Hall Junior College; Academic Dean of Linden Hall Junior College, Lititz,
 Pennsylvania.
 At California State Polytechnic College since 1946.

MARTINSEN, M. C.-----Aeronautical Engineering
 Graduate California Polytechnic, 1917, in Mechanics Engineering; additional
 study, University of California at Los Angeles; holds certificates issued by Civil Aero-
 nautics Authority as Aircraft Pilot; Aircraft and Engine Mechanic; Ground and
 Mechanics School Instructor.
 Experience: Travel South America, France; U. S. Army Engineer, World War
 I; electrician, Reynolds Electric Company, Santa Barbara, California; steam engineer,
 Union Oil Company, Avila, California; machinist, C. F. Brann Company, San Fran-
 cisco, California; shop foreman, Santa Barbara Motor Company; owner and operator,
 Automotive Repair Business, Santa Barbara, California; mechanic, Lockheed Aircraft
 Corporation, Burbank, California; instructor, Navigation, U. S. Naval Flight Prepar-
 atory School.
 At California State Polytechnic College since 1930.

MATTHEW, THEODORE—A.B., Chem. Engr.-----Chemistry
 A.B., University of California at Berkeley, 1922; Chem. Engr., Stanford Univer-
 sity, 1930.
 Experience: Playground director, Berkeley Recreation Department; officer in
 U. S. Army Air Corps; Americanization English for foreigners, Oakland Evening High
 School; vice principal, Haight Elementary School, Alameda, California; instructor
 in physics and chemistry, Richmond Union High School, Richmond, California; direc-
 tor of civilian pilot training, San Mateo Junior College; owner-operator and chemical
 engineer, Dried Fruit Specialties Company, San Francisco.
 At California State Polytechnic College since 1948.

MAURER, ROBERT L.—A.B., M.A.-----English and Psychology
A.B., Western Reserve University, 1935; M.A., Western Reserve University, 1936.

Experience: Instructor of English, Ohio State University, Columbus, Ohio, and Oregon State College, Corvallis, Oregon; instructor and training director in U. S. Air Force School; instructor and academic supervisor, Army Military Intelligence Service; teaching fellow in psychology, Ohio State University.

At California State Polytechnic College since 1948.

MEACHAM, VERNON H.—B.S.-----Agricultural Engineering
B.S. from University of California, 1924.

Experience: Agricultural instructor, Gilroy High School; Director of Agriculture, Manteca High School; Dairy Herdsman, California State Polytechnic College; Instructor at California State Polytechnic College; In charge of Voorhis Unit, California State Polytechnic College, 1939-1943; Instructor in Navigation, Naval Flight Preparatory Program; Instructor Mathematics and Physics, Naval Academic Refresher Unit Program.

At California State Polytechnic College since 1929.

†MEINHART, CHARLES J.-----Welding
Three years at California State Polytechnic College, majoring in Aeronautical Engineering; received certificate of welding, Hobart Welding School, Troy, Ohio.

Experience: Served in U. S. Navy; supervision of erection crew doing new construction, repair and maintenance, Marietta Manufacturing Company, Pt. Pleasant, West Virginia; Student Assistant (Welding), California State Polytechnic College; Welding Instructor, San Luis Obispo High School and Junior College.

At California State Polytechnic College since 1949.

MERSON, JAMES F.—B.A.-----Head, Agricultural Engineering and
Mechanics Department

Graduate San Jose State College, 1928; received B.A., San Jose State College, 1932; graduate work University of California at Davis.

Experience: Western Electric Company, Oakland; Instructor Agricultural Mechanics, Dos Palos High School; Instructor Agricultural Mechanics, Santa Rosa High School.

At California Polytechnic College since 1936.

METZ, ROY F.-----Aeronautical Engineering

Cass Technical School of Engineering, 1914; additional study various aircraft and engine companies including the Wright Aeronautical Corporation, Pratt and Whitney Corporation, United Air Lines; holds Civil Aeronautics Authority Aircraft and Engine certificate; Instructor, aero engines in the U. S. Naval Flight Preparatory School.

At California State Polytechnic College since 1937.

MILHAM, FOREST KNEL.—B.S., M. A.-----Chemistry

B.S., University of Nebraska, 1937; M.A., Claremont Graduate School, 1950.

Experience: Research chemist, Certain Seed Production Corporation, Buffalo, New York, 1937-1938; Chief Chemist, Pratt Food Company, Buffalo, New York, 1938-1940; Chief Chemist, Albers Manufacturing Company, Oakland, California, 1940-1942; U. S. Army, 1942-1946.

At California State Polytechnic College since 1947.

MILLER, ROBERT W.—B. S., M.S.-----Animal Husbandry

B.S., Montana State College, 1948; M.S., State College of Washington, 1949.

At California State Polytechnic College since 1949.

† On military leave.

***MORAN, GABRIEL T.—B.A.-----Chemistry**

B.A., Whittier College, California, 1942.

Experience: Chemist at American Potash and Chemical Company, Trona, California; Thompson Products, Bell, California; Paul Dickerson, Chemistry Laboratory; District Agricultural Laboratory, Whittier, California.

At California State Polytechnic College since 1948.

MOTT, ROBERT A.—B.S., M.A.-----Department Head, Physical Education

B.S., University of Akron, 1939; additional graduate work, University of Michigan and University of Akron; M. A., University of Southern California.

Experience: Physical education instructor and athletic coach at B. F. Goodrich School, Akron; Coach at Akron West High School; served in the U. S. Navy as athletic officer, 1942-1946.

At California State Polytechnic College since 1946.

NEEDHAM, ROBERT A.—B.S.-----Aeronautical Engineering

B.S., Oregon State College, 1946.

Experience: Inspector, North American Aviation Corporation, Inglewood; stress engineer, Boeing Aircraft Co., Seattle, Washington; stress engineer, North American Aviation, Inglewood.

At California State Polytechnic College since 1949.

NELSON, CARL RUSSELL—B.S.-----Dairy Husbandry

B.S., Kansas State College, Manhattan, Kansas, 1941.

Experience: Instructor, Kansas State College, Manhattan, Kansas; Extension Dairyman, Manhattan, Kansas; Extension Agent, Manhattan, Kansas.

At California State Polytechnic College since 1949.

NERESON, OBERLIN B.—B.A., M.A.-----Director of Guidance

B.A., Luther College, 1927; graduate work at Northwestern University, 1930; M.A., University of Minnesota, 1939; additional graduate work at University of Southern California.

Experience: Teacher and principal at Barnesville High School, Barnesville, Minnesota, 1927-1930; Principal of High School, Pelican Rapids, Minnesota, 1930-1938; Superintendent of Schools, Barrett, Minnesota, 1938-1939; Principal of High School, Alexandria, Minnesota, 1939-1943; Instructor in psychology, Visalia College, Visalia, California, 1946-1947; Personnel officer at U. S. Navy Receiving Station, Terminal Island, Naval Air Base, Tinian, and U. S. Naval Air Base, Guam, 1943-1946.

At California State Polytechnic College since 1947.

NOBLE, GLENN A.—A.B., M.A., Ph.D.-----Acting Head of Biological Sciences Department

A.B., University of California, 1931; M.A., University of California, 1933; Ph.D., Stanford University, 1940.

Experience: Assistant in zoology, College of Pacific, 1933-1935; Instructor, Department Head, San Francisco Junior College, 1935-1946; Consultant in biology, American Military Government in Korea, 1946-1947.

At California State Polytechnic College since 1947.

NOLAN, THOMAS F.—B.S., M.A.-----English and Social Science

B.S., University of Wisconsin, 1935; M.A., University of Southern California, 1938.

Experience: Instructor, Senior High School, Stockbridge, Wisconsin; Instructor, Senior High School, Kaukauna, Wisconsin; Instructor, American School, Quito, Ecuador; Economic Analyst, Department of State, Washington D. C., at Montevideo, Uruguay; Officer, U. S. Navy; Vice Consul, Department of State, Washington, D. C., at Valparaiso, Chile.

At California State Polytechnic College since 1949.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

O'DANIELS, HOWARD R.—B.C.S.-----Athletics

Bachelor of Commercial Science, University of Santa Clara, 1931; additional graduate study, University of Southern California.

Experience: Director of physical education, Mission High School, San Luis Obispo, California; at California Polytechnic School as coach, 1933-1942; Served in U. S. Navy as an officer, 1942-1945.

Returned to California State Polytechnic College in 1945.

PARKER, HARRY-----Animal Husbandry

Graduate Kent College, Canterbury, England, 1918; attended Kingston Agricultural College, Leicestershire County, England, 1918-1920.

Experience: Herdsman, Edward Best Shorthorn Ranch, Mount Vernon, New Hampshire; C. A. Smith Hereford Ranch, Chester, West Virginia; Peter Ross Shorthorn Ranch, Danville, Illinois; William Briggs Hereford Ranch, Dixon, California.

At California State Polytechnic College since 1932.

PARSONS, M. RAY—B.S.-----Agricultural Engineering

B.S. in agriculture, North Dakota Agricultural College, 1942, and B.S. in Agricultural Engineering at North Dakota Agricultural College, 1946.

Experience: Farmed in North Dakota two years; Instructor in the Department of Correspondence Study at the North Dakota Agricultural College, courses in mathematics and mechanics; L. B. Hanna Stock Farm in North Dakota for two years; employed by highway and airport construction companies; served in the U. S. Army, 1942-1945; part-time extension in Agricultural Engineering, North Dakota Agricultural College.

At California State Polytechnic College since 1946.

*PENLEY, LAVINA-----Librarian

Experience: Assistant librarian, Pomona Public Library; acting librarian, Upland Public Library; assistant librarian, Pomona High School; librarian, Emerson Junior High School, Pomona.

At California State Polytechnic College since 1946.

*PETERS, GEORGE D.—B.S.-----Citrus Fruit Production

B.S., Oregon State College, 1943.

Experience: Citrus fruit production, Ventura County, California.

At California State Polytechnic College since 1948.

PETERSON, GERALD B.-----Electronic and Radio Engineering

Experience: Eight years as independent radio service man; radio operator, WHA radio station, University of Wisconsin; officer, instructor in radio and sound, in U. S. Navy.

At California State Polytechnic College since 1947.

*PROCSAL, ROBERT L.—B.S.-----Head, Crops Department

B.S., California State Polytechnic College, 1946.

Experience: Officer, U. S. Army Air Force; Borden's Dairy Delivery Service, Oakland; Vocational Agricultural Instructor, Central Union High School, El Centro; managed 60-acre diversified farm.

At California State Polytechnic College since 1949.

PROUSE, GEORGE D.—A.B., M.A.-----Physical Education

A.B., Stanford University, 1948; M.A., Stanford University, 1950.

Experience: Physical Education Instructor and Coach, Menlo College, Menlo Park; Athletic Director, Devereaux Ranch School, Santa Barbara, and Y. M. C. A. Camp, Catalina; Officer, Army Air Corps.

At California State Polytechnic College since 1950.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

PURSEL, CLAUDE A.—A.B., M.A.-----Mathematics
A.B., Hastings College, Hastings, Nebraska, 1935; M.A., University of Southern California, 1947.

Experience: Instructor of mathematics, physics, and Superintendent of Public Schools, Lushton, Nebraska, 1935-1945; teaching assistant in mathematics department, University of Southern California, 1945-1947.

At California State Polytechnic College since 1947.

RADIUS, CLARENCE—B.S.-----Head of Electronic and Radio Engineering Department
B.S., University of Chicago, 1932; Graduate work in electron physics, University of Chicago; Graduate work in communications engineering at Stevens Institute of Technology, New Jersey.

Experience: Instructor in physics at the Chicago Junior College; Engineer at Chicago Apparatus Company; Instructor in radio frequency engineering at RCA Institutes, Chicago; Head of the department of audio-video technology at RCA Institutes, New York; Engineer at Radiomarine Corporation of America, New York; Lecturer in television for National Broadcasting Company in New York, Chicago, and Hollywood.

At California State Polytechnic College since 1946.

REECE, ROBERT HOWELL—B.S.-----Mechanical Engineering
B.S. in mechanical engineering, University of Illinois, 1920.

Experience: Employed as steel plate work estimator with Joseph T. Ryerson & Son, Chicago; employed by Illinois Engineering Company in connection with mechanical equipment of power plants, railroad roundhouses; City of Chicago in connection with water filter plant; and with Skidmore, Owings and Merrill, Architects and Engineers, in Chicago and New York; served in the U. S. Navy as an officer, 1942-1945; and with Wurdeman and Becket, Architects and Engineers, as mechanical engineer, Los Angeles, California.

At California State Polytechnic College since 1946.

*REES, DONALD E.—A.B., Ph.D.-----Chemistry and Mathematics
A.B., Whittier College, 1942; M.S., University of Iowa, 1943; Ph.D., University of Iowa, 1947.

Experience: Teaching Assistant and Research Fellow, University of Iowa; Officer, U. S. Navy; Group Leader, Research Department, Shell Oil Co., Inc.

At California State Polytechnic College since 1949.

REMUND, CLIVE—B.S.-----Agricultural Engineering
B.S. in agriculture at Utah Agricultural College, 1931.

Experience: Seven years teaching experience Utah high schools; Director of Vocational Agriculture and Critic Teacher at Elk Grove Union High School, California; Director of Vocational Agriculture and Cadet Teacher, Paso Robles Union High School.

At California State Polytechnic College since 1946.

RICHARDS, C. C.—B.A.-----Machine Shop
B.A., Santa Barbara State College, 1942.

Experience: Extensive experience in industrial plant construction work and machinery installation with O. C. Fields Gasoline Corporation; Served in U. S. Navy, 1942-1945.

At California State Polytechnic College since 1946.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

RICKANSRUD, TORLEIF M.—B.A., M.S.-----Physics and Mathematics

B.A., Luther College, Decorah, Iowa, 1922; M.S., Iowa State College, 1940; additional graduate work, University of St. Louis, 1942-1943.

Experience: Superintendent of Schools and Director of Science Department at Rolla Public Schools, Rolla, N. Dakota; Superintendent of Schools and Director of Science Department Omeme Public Schools, Omeme, N. Dakota; Superintendent of Schools and Director of Science Department at Lansing Public Schools, Lansing, Iowa; Electronics Instructor in Advanced Radar School, Truax Field, Madison, Wisconsin, 1943; Instructor, mathematics and physics in U. S. Naval Flight Preparatory School and the Naval Academic Refresher Unit. Holds Civil Service rating as radio engineer.

At California State Polytechnic College since 1943.

RICHARDSON, JOY O.—B.S., M. of Engr.-----Mechanical Engineering

B.S., University of Nebraska, 1940; M. of Engr., Yale University, 1942.

Experience: Instructor, Yale University, New Haven Junior College, New Haven, Connecticut; instructor, Orland High School, Orland, California; machine designer, Rockbestos Products Corporation; engineer, Marlin Firearms Company, Bristol Aeronautical Corporation, New Haven, Connecticut; engineer, Johns Manville Corporation, Tilton, New Hampshire; vice president and treasurer, Richardson Industries, Incorporated, East Haven, Connecticut.

At California State Polytechnic College since 1948.

RIEBEL, JOHN P.—B.S., B.A., M.A.-----English

B.S., University of Kentucky, 1924; B.A., University of Southern California, 1927; M.A., University of Southern California, 1928; additional graduate work, University of Illinois.

Experience: Instructor in English, Georgia School of Technology; assistant in English, University of Illinois; acting head of English department, Austin Peay Normal, Clarksville, Tennessee; editor and author, L. W. Singer Co., Syracuse, New York; nine years as instructor in charge of composition, General Motors Institute; instructor, University of Detroit Evening College of Commerce; editor and assistant manager of customer relations, Cadillac Motor Car Division, Detroit.

At California State Polytechnic College since 1947.

RITTENHOUSE, EUGENE A.—B.S., M.B.A.-----Industrial Economics

B.S., University of California, Los Angeles, 1947; M.B.A., University of California, Berkeley, 1948; additional graduate work, University of California, Berkeley; New York Stock Exchange Institute, one year correspondence course.

Experience: Junior Bookkeeper, J. J. Elmore Co., Brawley; Broker's Clerk, Dean Witter & Co., Los Angeles; Purchasing, War Department, U. S. A. A. F., Trinidad, B. W. I.; Served in U. S. Navy; Student Teacher, Albany High School, Albany; Student Teacher, Berkeley High School, Berkeley.

At California State Polytechnic College since 1949.

ROGERS, EDWARD P.—B.A.-----Industrial Economics

B.A., University of California, Los Angeles, 1940; Graduate work at University of Southern California.

Experience: Plant Personnel and Labor Relations, Lockheed Aircraft Corporation, Burbank; Personnel Manager, Naco Manufacturing Co., Huntington Park; Administrative Assistant to Director of Industrial Relations, Pacific Airmotive Corporation, Burbank.

At California State Polytechnic College since 1950.

RONEY, ELLIS L.—B.S., M.S.-----Radio and Electronics

B.S., Stanford University, 1947; M.S., Stanford University, 1948.

Experience: One and one-half years as an instructor in junior colleges of California; owner, Ellis L. Roney Radio Service in Modesto, California; test engineer, Hewlett-Packard Company, Palo Alto, California; teaching assistant and Loran Research, Stanford University.

At California State Polytechnic College since 1948.

SANKOFF, LEO—B.S.-----Poultry and Agricultural Engineering
B.S., California Polytechnic, 1942.
Experience: Director of Agriculture, Fillmore High School.
At California State Polytechnic College since 1946.

SHARPE, NORMAN—B.A., M.A.-----Head of Air Conditioning and Refrigeration
Engineering Department
B.A., University of California at Los Angeles, 1929; M.A., University of Southern California, 1939.

Experience: Research Engineer, Carrier Engineering Corporation, Newark, New Jersey, 1930; Design Engineer, Carrier Engineering Corporation; physics and mathematics Instructor, Los Angeles City Schools; Design and Construction Engineer, Luppen and Hawley.

At California State Polytechnic College since 1937.

*SHESLER, FRANKLIN B.—B.A., M.S.-----Air Conditioning and Refrigeration
B.A., Santa Barbara State College, 1942; M.S., Oregon State College, 1947.
Experience: Officer in U. S. Navy; instructor in machine shop, Santa Barbara College.

At California State Polytechnic College since 1947.

SMITH, JAMES STEELE—B.A., M.A.-----English
B.A. in English, University of California, 1934; M.A. in English, University of California, 1936; Additional graduate work at the University of California.

Experience: Instructor, University High School, Berkeley, and Red Bluff Union High Schools; Teaching fellow, University of California; Instructor, University of California, Davis; U. S. Army; Instructor, Washington State College; Professional writing.

At California State Polytechnic College since 1946.

SMITH, MORRIS EUGENE—A.B., M.A.-----Political Science and History
A.B. in political science and history, University of California, 1934; M.A. in political science and English, 1937; Additional graduate work at the University of California.

Experience: Five years Piedmont High School English instructor and tennis coach; Served in U. S. Army as Intelligence Officer, 1942-1946.

At California State Polytechnic College since 1946.

†ST. CLAIR, JAMES S.—B.S., M.S.-----Economics and Agricultural Economics
B.S., University of California, 1939; M.S., University of Illinois, 1947.

Experience; Research assistant in Agricultural Prices and Statistics, University of Illinois; In the Service of U. S. Army, 1942-1945.

At California State Polytechnic College since 1946.

STEINER, ERNEST ALFRED-----Security Officer and Instructor in
Fire and Accident Prevention

Experience: Fire Engineer, Long Beach Fire Department, 1923-1943; Fire protection, fire prevention, and general security officer, U. S. Navy, 1943-1946.

At California State Polytechnic College since 1947.

STEUCK, FRED HENBY—B.S.-----Electrical Engineering
B.S. in electrical engineering, Iowa State College, 1937.

Experience: Assistant engineer, Nebraska Power Company, Omaha, 1937-1938; Manager, O'Brien Company Rural Electrification Corporation, 1938-1942; Radar officer, U. S. Naval Reserve, 1944-1946; Electrical Instructor, U. S. Naval Training School, Iowa State College, 1942-1944; Engineer, Silent Sioux Burner Corporation, Orange City, Iowa, 1946.

At California State Polytechnic College since 1947.

* On military leave.

† On educational leave.

STOBBE, ARTHUR J.—Ph.B., B.L.S., M.L.S.-----Order Librarian
Ph.B., Marquette University, 1937; B.L.S., Syracuse University, 1947; M.L.S., University of California, Berkeley, 1949.

Experience: Radio Research Interviewer, Radio Station WTMJ, Milwaukee, Wisconsin; Reporter, Milwaukee Sentinel, Milwaukee, Wisconsin; Served in U. S. Army; Officer in U. S. Army Air Corps; Librarian, Milwaukee Public Library, Milwaukee, Wisconsin; Reference Librarian, Grosvenor Reference Library, Buffalo, New York; Research Assistant, University of California School of Librarianship, Berkeley. At California State Polytechnic College since 1949.

* STULL, ROBERT B.—A.B., M.A.-----Physical Education and Athletics
A.B., Whittier College, 1941; M.A., Whittier College, 1947.

Experience: Coached basketball, Whittier College; graduate manager, Whittier College; instructor, physical education and political science, Montebello High School, Montebello, California, and at Valencia High School, Placentia, California; served as officer in U. S. Navy for four years.

At California State Polytechnic College since 1947.

TALBOTT, JOHN WILLIAM—B.S.-----Truck Crops and Agronomy
B.S., College of Agriculture, University of California, Davis, 1949.

Experience: Field Assistant, University of California, Davis; general farm work, 76 Ranch, Lemhi, Idaho; Loose Fruit Sales, College Heights Orange Association, Claremont.

At California State Polytechnic College since 1949.

THOMSON, DAVID H.—B.S., M.A.-----Biological Sciences
B.S., University of Arizona in education and zoology; M.A., Claremont Graduate School, 1948.

Experience: Laboratory instructor, Pomona College.

At California State Polytechnic College since 1946.

TURNER, ALDEN L.-----Aeronautical Engineering
Graduate of California State Polytechnic College, 1936.

Experience: United Air Service, Ltd.; Stearman Aircraft; Lockheed Aircraft; Hancock College of Aeronautics at Santa Maria; served as an officer U. S. Air Forces, 1941-1946.

At California State Polytechnic College since 1946.

VAN NEST, ISAAC G.-----Air Conditioning and Refrigeration

Experience: 28 years as engineer in Los Angeles; Cudahy Packing Company, Pioneer Paper Company, National Ice Company, Methodist Hospital, Orthopaedic Hospital, Globe Ice Cream Company, Automobile Club of Southern California; ammonia pipe fitter and supplies salesman for various contractors and engineers for five years; air conditioning and refrigeration instructor for five years in U. S. Marine Corps and U. S. Navy; chief engineer, Cottage Hospital, Santa Barbara, California, for five years.

At California State Polytechnic College since 1948.

VORHIES, RALPH M.—B.S., A.M.-----Crops
B.S. in agriculture, University of Missouri, 1938; A.M. in horticulture, University of Missouri, 1941.

Experience: High School teacher of vocational agriculture at Belton, Missouri; Instructor Southeast State Teachers College; Instructor Cape Girardeau, Missouri; served in U. S. Navy as an officer from 1942-1946.

At California State Polytechnic College since 1946.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

*WEEKS, LOWELL K.—B.A.-----Music and English
B.A., University of New Mexico, 1938; graduate work, University of New Mexico and University of Southern California.

Experience: Instructor in Music and English, Los Lunas High School, Los Lunas, New Mexico; U. S. Army.

At California State Polytechnic College since 1947.

*WELCH, HARRY V., JR.—B.S.-----Soils
B.S., University of California at Los Angeles, 1941; additional study, University of Hawaii.

Experience: University of California Citrus Experiment Station, Riverside; Farm Security Administration.

At California State Polytechnic College since 1947.

WESTON, RALPH E.—A.B., M.A.-----Mathematics
A.B., Stanford University, 1922; M.A., Stanford University, 1933.

Experience: 19 years mathematics teacher in the secondary schools of California; electrical engineer, P G & E, San Francisco; visiting professor of mathematics, University of Idaho; visiting associate professor, University of Southern California, Santa Maria; engineering aide, U. S. Engineers, Sacramento.

At California State Polytechnic College since 1948.

†WHITEHEAD, DUANE B.—B.S.-----Agricultural Mathematics
B.S., University of Southern California, 1947.

Experience: Teacher of physical education, Covina Union High School, Covina, California; Instructor in physical education, U. S. Marine Corps; operation and repair of citrus culture farm machinery, La Verne, California; operator of orchard heating equipment, La Verne.

At California State Polytechnic College since 1948.

WHITING, F. F.—B.S., M.A.-----Machine Shop
B.S. in industrial education, Stout Institute, Menomonie, Wisconsin, 1931; M.A., University of Minnesota, 1938.

Experience: Teacher, metalwork, Eau Claire, Wisconsin; Junior High School and Marshall Senior High School, Minneapolis, Minnesota. Summer session instructor in metal work, University of Ohio; University of Minnesota, 1942-44. Served in the U. S. Navy as an officer, 1944-46.

At California State Polytechnic College since 1946.

WHITSON, MILO E.—Ph.B., M.A., Ed.D.-----Head of Mathematics Department
Ph.B., Washburn College, Topeka, Kansas; M.A., George Peabody College for Teachers; Ed.D., University of Southern California, 1949.

Experience: Seven years in elementary schools in Kansas; seven years in junior high schools, including teaching in mathematics, literature, and physical education, and Principal, Topeka Junior High School; officer in U. S. Navy; instructor mathematics at University of Southern California.

At California State Polytechnic College since 1947.

WINEROTH, HARRY J.—B.S.-----Housing Supervisor
B.S., California State Polytechnic College, 1946; graduate work, University of California, Davis, 1947.

Experience: Served in U. S. Navy as Athletic and Welfare Director; Instructor, Fullerton High School and Junior College, Fullerton; Instructor, Coachella Valley High School, Coachella.

At California State Polytechnic College since 1949.

* Located at the Voorhis Unit of California State Polytechnic College at San Dimas, California.

† On military leave.

WILEY, RICHARD C.-----Weiding
Special engineering courses at Stanford University; Industrial Arts training, San Jose State College and University of California.

Experience: Seven years master mechanic and welder, Utah Construction Company; trade experience with Eaton and Smith, contracting engineers; utilities department of the city of Palo Alto; two and one-half years War Production training instructor in welding, Sacramento Junior College, Palo Alto, and San Francisco school systems; instructor in welding, Leland Vocational Evening High School; senior welding engineer, Joshua Hendy Iron Works, Sunnyvale, California.

At California State Polytechnic College since 1946.

WOLF, HARRY K.—B.S., M.A.-----Electronic and Radio Engineering
California Polytechnic, 1927-29; received B.A., Arizona State Teachers College, Flagstaff, 1933; M.A., University of Arizona, 1941; additional graduate study at the University of California and University of Arizona.

Experience: Supervisor for Agricultural Adjustment Administration; instructor of mathematics and science, Camp Verde High School, Camp Verde, Arizona; head of mathematics department, El Dorado County High School, Placerville, California; U. S. Army Signal Corps training program instructor; instructor, navigation in the U. S. Naval Flight Preparatory School and mathematics and physics in the Naval Academic Refresher Unit.

At California State Polytechnic College since 1942.

WOODWORTH, JOHN A.—A.B., M.A.-----Mathematics
A.B., Hastings College, 1939; M.A., University of Southern California, 1948; additional graduate work, University of California, Berkeley, and Humboldt State College.

Experience: Principal, Purdum High School, Purdum, Nebraska; Principal, St. Paul Elementary School, St. Paul, Nebraska; Principal, Nysted High School, Dannebrog, Nebraska; Instructor, Baldwin Park Elementary School, Baldwin Park; Instructor, Salinas Junior High and Evening School, Salinas; Instructor, Santa Ana Army Air Base, Santa Ana; Physicist, University of California Radiation Laboratory, Berkeley; Principal, Hopland Union High, Hopland.

At California State Polytechnic College since 1949.

WRIGHT, DOROTHY S.—A.B.-----Assistant Librarian
A.B. in philosophy and English, Occidental College; graduate work at University of California; received certificate from University of California School of Librarianship.

Experience: Pasadena Public School Library; Long Beach School Libraries; Occidental College Library.

At California State Polytechnic College since 1946.

ZILKA, THOMAS J.—B.S., M.S.-----Head, Mechanical Engineering Department
B.S., Oregon State College, 1941; M.S., Oregon State College, 1943.

Experience: Instructor in mechanical and aeronautical engineering, Oregon State College; assistant airworthiness requirements engineer, Boeing Aircraft Co.; assistant professor in aeronautical engineering, Montana State College.

At California State Polytechnic College since 1947.

THE STATE BUREAU OF AGRICULTURAL EDUCATION

The State Bureau of Agricultural Education is a division of the State Department of Education, with headquarters at California State Polytechnic College. The bureau is in charge of all vocational agriculture instruction in the State. Because the principle bureau offices are located on the campus, and because the college and its staff participate actively in In-Service training for vocational agriculture teachers, California State Polytechnic College is considered the "headquarters" for vocational agriculture in California.

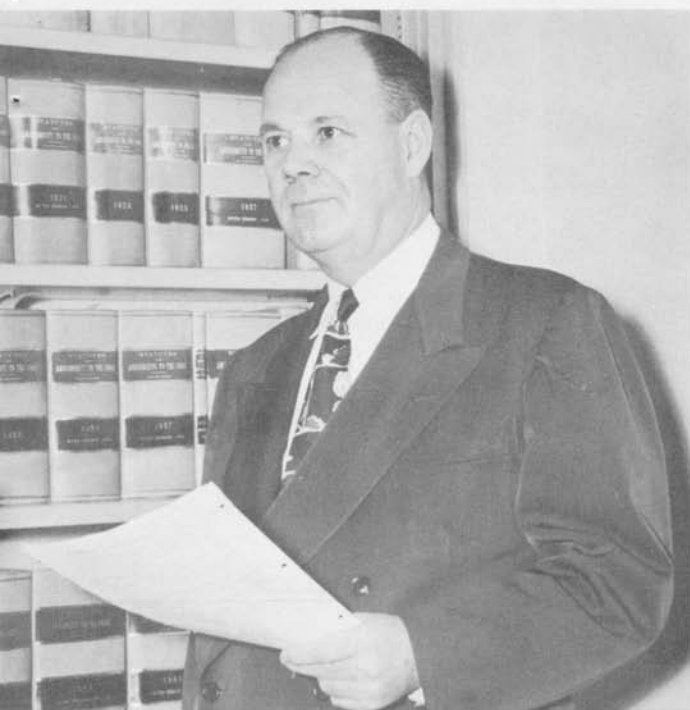
Members of the bureau staff are well-informed on activities of the college, and are always willing to discuss the college with prospective students. The State Bureau of Agricultural Education staff directory is listed below:

DIRECTORY STATE BUREAU OF AGRICULTURAL EDUCATION

Headquarters at California State Polytechnic College

B. J. McMAHON, Chief of Bureau	California Polytechnic, San Luis Obispo
H. H. BURLINGHAM, Teacher-Trainer	California Polytechnic, San Luis Obispo
H. F. CHAPPELL, Regional Supervisor	Library and Courts Building, Sacramento
GEORGE P. COUPER, Special Supervisor	California Polytechnic, San Luis Obispo
K. B. CUTLER, Regional Supervisor	809-C California State Building, Los Angeles
B. R. DENBIGH, Regional Supervisor	809-C California State Building, Los Angeles
E. W. EVERETT, Supervisor Veterans Training	275 N. First St., San Jose
G. A. HUTCHINGS, Regional Supervisor	California Polytechnic, San Luis Obispo
M. A. KIPF, Special Supervisor	809-C California State Building, Los Angeles
J. D. LAWSON, Special Supervisor	California Polytechnic, San Luis Obispo
M. K. LUTHER, Regional Supervisor	275 N. First St., San Jose
W. J. MAYNARD, Special Supervisor	275 N. First St., San Jose
R. H. PEDERSEN, Regional Supervisor	Fresno State College, Fresno
A. G. RINN, Regional Supervisor	Fresno State College, Fresno
S. S. SUTHERLAND, Teacher-Trainer	University of California, Davis
J. I. THOMPSON, Livestock Specialist	California Polytechnic, San Luis Obispo
HARMON TOONE, Special Supervisor	Library and Courts Building, Sacramento
J. EVERETT WALKER, Regional Supervisor	208 Sowillenno Building, Chico

GENERAL INFORMATION



Left: President Julian A. McPhee is now able to devote full time to the job of directing the program of the expanding college after resigning from the position of State Director of Vocational Education in January, 1949.



Above: The Walter Friar Dexter Memorial Library Building was completed for its opening in September, 1949. The \$700,000 building has two large reading rooms, stack room space for 120,000 books, and several special features.



Top: Students show lambs in the livestock show in the biggest event of the entire school year—the annual Poly Royal celebration which attracts thousands to the campus each spring. **Center:** The Majors and Minors is one of the college's musical groups which performs on an annual spring tour in various sections of the State. **Bottom:** Comfortable and well-equipped trailers provide housing for married veterans on the campus.

GENERAL INFORMATION *

THE COLLEGE PLANT

Lands

The lands of the California State Polytechnic College total about 4,650 acres, of which 3,700 acres are embraced in the home unit at San Luis Obispo, 157 acres in the Voorhis Unit at San Dimas, and 800 acres in the Kellogg Unit, Pomona.

Because the curricula of the California State Polytechnic College are primarily concerned with teaching production practices and skills, the availability of good farm land is a major factor. A different type of land is needed for each major agricultural field; pasture and range for beef cattle, dairy cattle, sheep and swine; range for poultry, hay and alfalfa land; and irrigable land for truck and field crops. Orchard land must be climatically situated as to frost and sunshine.

While additions must eventually be made to round out this land need as student enrollment increases, in order to give each student as much opportunity as possible for actual project operation, the present properties are in the main satisfactory and diversified. Good drainage throughout makes flood damage impossible in the heaviest rainfall. Both branches are located in thermal belts.

There are several hundred acres at San Luis Obispo suitable only for range purposes. Other land is devoted to hay, alfalfa, and orchard. The major campus with land immediately surrounding various buildings now requires about 100 acres.

At San Dimas, about 30 acres of the land utilized for citrus, avocados, and a small deciduous tract, are well adapted to these uses. Some additional acres may be utilized for further deciduous plantings. Considerable land is now in the rough state, suitable for expansion. (All information regarding facilities, buildings, general information, curriculum, and course descriptions at the Voorhis Unit will be found listed under the Voorhis Division of the catalog.)

Buildings

Buildings on the campus and farm include the general structures for dormitory, classroom and administration use, and the headquarters for the major departments.

Dormitories

The San Luis Obispo campus has four main dormitory buildings, a unit of five dormitories, a four-wing resident unit with adjoining recreational hall, and two groups of cottages. The four main buildings house about 275 students, the dormitories house 250 students, and the resident unit will accommodate another 250 students. The two cottage groups each contain three buildings housing 12 students, making a total of 72 men living in these home-like structures, which are located adjacent to agricultural production units for the convenience of the students who assist in the operation of these agricultural units.

Cafeterias

Two cafeterias, both serving three meals per day, seven days per week, and capable of accommodating a total of 2,000 students per meal, are located on the campus. Cafeteria No. 1 is located near the main dormitory group, and Cafeteria No. 2 is located adjacent to the dormitory housing units. Meals are sold to students on meal tickets or separately.

Health Center

A 16-bed infirmary with a completely equipped examination and treatment room is located on the campus near the dormitory units. Two full-time nurses and two student assistants make it possible to give 24-hour medical service to students. A physician is in attendance daily five days per week and on call at all times.

Veterans' Village

For married veterans the college has provided a "village" consisting of 75 movable houses and 238 trailers located on the campus. Of the 75 movable houses, 38 are

* See also Voorhis Unit section.

three-room units with two bedrooms, kitchenette, bath, and living room; 37 are two-room units with bedroom, living room combined with kitchenette, and bath. The trailers are constructed along conventional lines. The "Veterans' Village" is now completely landscaped, has central wash rooms with electric washing machines, and all modern conveniences. Milk and poultry products, as well as fruit and truck crops, can be purchased by resident families at the campus sales stores of these departments.

To help alleviate the housing shortage problem facing new instructors, the college brought in five four-apartment units in the fall of 1946 to house 20 faculty families.

Athletic Facilities

A recent addition to the college's physical education facilities is the new \$60,000 athletic field, which was dedicated May 3, 1947. The new field includes a regulation quarter-mile track with a 220-yard straightaway, a new practice football field, a regulation baseball diamond with the shortest foul line extending 320 feet from home plate. The new athletic plant, completely enclosed by a wire fence, covers an area of 10 acres, includes an outdoor basketball court, and will include two more tennis courts. A new field house is adjacent to the ball park and provides locker and shower facilities for 200 men.

The college's gymnasium has been enlarged to accommodate some 1,200 spectators and to provide additional floor space for boxing, gymnastics, fencing, wrestling, badminton, and other minor sports. The gymnasium has two separate locker rooms with modern shower rooms. One is adjacent to the adjoining indoor swimming pool, which is 75 feet long and 35 feet wide. The pool is complete with heating, filtration and chlorinating equipment and has a spectator gallery which will seat 300 persons.

Close to the gymnasium is the football field with permanent grandstand and bleachers seating about 6,000 persons. The field is adequately lighted for night games. Nearby are tennis courts for both varsity and general student participation.

Classroom and Administration Building

In keeping with the progress of the California State Polytechnic, a new Classroom and Administration Building was constructed in 1941-42. This new unit with its 52,000 square feet of floor space occupies a commanding position north of the gymnasium. The building is of Spanish design, with a tile roof and a clock tower at the northwest corner. The upper story accommodates large lecture classes, while the ground floor houses the administrative offices of the school and the Bureau of Agricultural Education, the accounting office, the registrar's office, and faculty offices. In the basement are housed the print shop, with bindery, publications offices, mimeograph room, and student store.

Library

Other major buildings are devoted to the library, classrooms, and general laboratories. The Walter F. Dexter Library, completed in 1949, seats 400 students in the reading rooms. It also provides four floors of stacks, film darkrooms, seminar and visual education rooms. Another is the Agricultural Education building, while the others are one-story units in the center of the campus, providing space for physical and biological science, music, landscape drafting, mathematics, and similar courses.

In addition to the permanent buildings, forty 20x48 foot temporary buildings have been moved onto the campus for classroom and laboratory purposes. Twenty of these units are equipped for use as classrooms. The remaining units are distributed over the campus in connection with existing laboratories and are used as laboratories and shops in the various departments.

Well distributed over the campus and farm are the major structures devoted to agricultural instruction. These include the following:

AGRICULTURAL INSTRUCTION BUILDINGS

Swine Unit

This consists of a central farrowing house, and more than 30 double colony houses and pens for feeder pigs, brood sows, and boars. The plant is under the supervision of an instructor and a student assistant; while many meat animal students have either self-owned swine projects or responsibilities in connection with the college herd.

Beef Unit

The beef unit consists of two widely separated plants. Newer of them is the beef feeding unit, consisting of two feeding wings and a central feed storage unit. This

accommodates about 150 steers, fed out annually in student projects. A central enclosed court provides excellent facilities for judging and other instruction, training in showmanship, and project supervision. The other building is a calving and feed storage barn at the northwest corner of the farm, for the foundation herd.

Central Feed Processing and Storage Plant

A feed processing building, 60x60 feet, was built in 1947 and is used extensively by students in grinding, mixing, and preparing feeds for livestock projects on the campus. In addition to the processing building, the plant includes eight storage tanks, 21 x 18 x 6 feet, which makes it possible to purchase and store one full year's supply of grain.

Sheep Unit

One of the more recent major agricultural buildings is located just north of the main campus, and provides permanent facilities for lambing, feed storage, and lamb feeding projects. The climate of San Luis Obispo is well adapted to sheep production and instruction in sheep husbandry.

Dairy Unit

The dairy unit consists of a large feeding barn, a milking barn and bottling plant, a calf barn, and a bull barn with welded steel pipe corrals and pens. All of these structures are located adjacent to each other along one campus road, giving a compact unit for instruction in dairy husbandry. A dairy building, 40x100 feet, with space for judging dairy cattle was added during 1946-47.

Poultry Unit

The poultry unit includes a central egg house and incubation building, also utilized for feed storage; a number of houses for egg-laying, brooding, trapnesting, and similar work. A number of range colony houses are also provided.

To facilitate the project program in which each Poultry Department student cooperates, a sales office and egg candling building was constructed and put into use in the fall of 1940. Construction was completed in 1947 on an addition to the Egg Processing and Sales Building. The addition includes lavatories, showers, butchering room, wrapping and refrigeration facilities.

Ornamental Horticulture Unit

Buildings for ornamental horticulture include a propagation house, greenhouses, and lath-houses. The entire campus provides the principal project area, with students doing all of the landscaping and grounds maintenance under the supervision of the instructors.

Draft Horse Barn

Three registered Suffolk mares and other draft horses are stabled at the draft horse barn and are used in various types of farming operations.

Thoroughbred Breeding Unit

A barn, paddocks, and pastures to accommodate eight Thoroughbred mares and their offspring, and two Thoroughbred stallions, was dedicated in December of 1940.

Mares were donated by the following men: C. E. Perkins, Walter T. Wells, Bing Crosby, Charles E. Cooper, A. W. De Veau, Walter H. Hoffman, and Henry P. Russell. A \$15,000 imported stallion was donated by Walter T. Wells.

Adequate barns and stalls are available to accommodate these mares and their foals and yearlings. Pastures and paddocks to accommodate mares and foals, and yearlings also are provided. The yearlings are sold at the California Breeders' annual sale.

California Breeders Association, under the program, is donating services of different stallions for these mares.

Agricultural Engineering

In addition to two older shop buildings devoted to agricultural engineering laboratory work, two shops, built in 1940 by the Federal Government for national defense training, have been converted and completely equipped as farm machinery laboratories. A farm machinery and agricultural engineering building, 100x180 feet with a 60x60 foot wing, was completed in the summer of 1947.

ENGINEERING INSTRUCTION BUILDINGS**Engineering Building**

In this large, modern, two-story structure, built in the spring of 1940, are the laboratories, faculty offices, and some of the classrooms used by three of the major engineering departments. The building, with its two large wings and an assembly room for 500 students, is completely air conditioned.

Air Conditioning and Refrigeration—Occupying one wing of the building, this department has one of the finest equipped college laboratories of its type in the United States. The laboratories, having a total of more than 6,720 square feet of floor space, have available for instructional purposes more than \$75,000 worth of equipment. These laboratories consist of a refrigeration laboratory, a heating and ventilating laboratory, and a sheet metal shop. In addition to these laboratories, technical students use the welding and machine shops extensively.

Architectural Engineering—Large, well-lighted drafting rooms, occupying the entire top floor of the Engineering Building are used exclusively by this department, which also has available on the same floor a well-equipped blueprint and reproduction room.

Electrical Engineering—This department occupies a wing of the Engineering Building approximately 40x110 feet, which is located adjacent to the college power plant. Approximately 1,500 square feet of floor space was made available to the department as an electrical shop building by the recent erection of an all-metal emergency structure behind the power plant. The laboratory and shop is well equipped with various types of D.C. and A.C. electrical apparatus, and tools and equipment for overhaul, maintenance and repair of electrical equipment.

Aeronautic Engineering Buildings

Supplementing the original aeronautical engineering building, which is primarily devoted to engine overhaul and laboratories, are a number of other buildings, including a new 120x100 foot hangar located adjacent to the college's flight strip. The flight strip is 3,000 feet long and 200 feet wide. A 20x48 foot utility building has been installed next to the hangar. In 1947 three all-metal buildings were constructed adjacent to the aeronautical engineering building: one 20x96 foot building for painting and laboratories; one 20x48 foot storage building; and one 20x68 foot building for engine overhaul, sandblasting, and cadmium plating.

Electronic and Radio Laboratory

The entire second floor of the Agricultural Education building is being used by the Electronic and Radio Engineering Department as four laboratories, a shop, an instrument stockroom, a small parts stockroom, and offices. The laboratories are equipped with special benches designed for radio work. The laboratory has ample testing instruments and equipment, including two radar units.

Power Plant

The central heating and power generating and utilities dispersing unit is used by the Mechanical Engineering Department as its laboratory. The power plant is equipped with internal combustion engines, steam engines and steam boilers, and produces a portion of the electric power used on the campus.

Machine Shop

This department has moved to a building constructed prior to the war as a machine shop for training defense workers. Complete new equipment has been installed in this well-lighted, large shop building, and all activities of the department have been transferred to the new location.

Welding Shop

A large, well-equipped welding shop is available for instruction to students from all divisions of the college. The rear of this shop has been converted into a welding engineering laboratory.

Other Facilities

In addition to the major buildings mentioned, facilities are provided for the many related subjects and sciences.

PROJECT OPERATION

Closely tied in with the college's objective of training students for an occupation is the college's unique project system. This system provides for projects, self-owned or operated by students in such a way as to provide an opportunity to gain knowledge and practical experience in commercial production and marketing of agricultural products or in the construction, rebuilding, repair, or maintenance of industrial machinery and equipment. This combination of the very practical "learn by doing" and "earn while you learn" philosophies not only enables a student to earn money while doing work directly related to his major academic interest, but also creates an added incentive for the more rapid acquisition of further skills and knowledge to the end that the projects will be more profitable.

In each major department students are encouraged by their instructors to take part in project activities, either individually or as a group. There is available a \$90,000 revolving fund from which students may borrow for an investment in livestock, ornamental plants, seeds, feed, machinery to be rebuilt, etc. No co-signer is required for a student to borrow from the project fund, and the fund is so operated as to guarantee against individual student financial loss. Most popular agricultural projects are those of fattening livestock, raising foundation beef, sheep, swine, or dairy cattle; conducting individual dairy projects or operating the project herd as a group; carrying on various production activities of the poultry unit as projects; growing field or truck crops and ornamentals.

In the industrial departments the projects are usually group rather than individual projects. In aeronautics, for example, the department, which is the 84th government approved repair station in the United States and operates under strict C.A.A. regulations, accepts aircraft or engines damaged beyond feasible commercial repair to be overhauled for their owners or to be purchased outright and rebuilt by students.

The project revolving fund of \$90,000 grew out of a loan arrangement started in 1924 with the Citizen's State Bank, which enabled students to borrow directly from the bank to finance their projects. Faculty members of the school stood behind this arrangement to protect the bank. From the very beginning to this project system, a small percentage of each student's net profit reverted back for the purpose of establishing and increasing the revolving fund. Because of the small enrollment in the early years of the project system, the fund was too small to handle the financing of all projects. Up until 1932, students were still borrowing money through the bank to finance many of the projects. After 1933, the college's rapid growth was instrumental in building the fund up to its present size.

The fund is administered by a nonprofit corporation known as the California Polytechnic School Foundation, the board of directors of which are all faculty members. It operates under a lease arrangement made through the State Departments of Education and Finance. Provisions of the lease define the use of the corporation's funds. The accounts are audited by the Department of Finance, and at the close of a fiscal year any cash or securities in excess of the given working capital, which has been set at \$90,000, is sent to the General Fund of the State. The project system of instruction is carried on at the Voorhis Unit of the college as well as at San Luis Obispo.

Agricultural Project Facilities at San Luis Obispo

The facilities available for agricultural projects are similar to those which would be found on any well-equipped ranch.

In foundation livestock, California State Polytechnic College has some of the best in the State. The beef herd includes Herefords, Angus, and Shorthorns, offspring of which are sold to the students. All necessary equipment for beef cattle production—barns, dehorning and loading chutes, castration equipment, stock horses, etc., are available. Many show champions have come from the beef herd.

The dairy herd includes purebred Jerseys, Guernseys, and Holsteins, including two State Fair champion bulls as herd sires. Equipment includes all the necessary paraphernalia for feeding, milking, care of calves and bulls, milk testing, bottling, separating, and other operations. Students own about 50 head of purebreds.

The swine herd is the outgrowth of a gift from C. Harold Hopkins, owner of Straloch farm, who gave his entire Poland herd—one of the best in western states. Poles, Berkshires, and Durocs are in the breeding herd. Equipment includes the farrowing pens, fattening pens, pig brooders, feeding equipment, etc. Students market between 600 and 700 fat and breeding swine each year.

The sheep flock is principally Hampshire and Southdown, including the sires and dams of many show champions. The new sheep unit centralizes the project facilities,

which are typical of a large scale farm enterprise. Students learn shearing and the care of fleeces, as well as lamb production.

The poultry flock consists of between 3,500 and 4,000 birds. The equipment includes a modern incubator, egg-handling facilities, brooders and brooder houses, pens for trap-nesting and pedigree work, and similar devices. A student assistant and the students themselves care for every operation under the supervision of the department head.

Equipment in ornamental horticulture includes land and buildings already mentioned, garden tractors, potting and spotting equipment, and landscape drafting.

SERVICE AND EXTENSION

The college serves as headquarters for the State Bureau of Agricultural Education. From this point, the bureau directly supervises vocational agriculture throughout the State and provides, with the assistance of the college, foundation stock for high school boys and teaching materials for 275 instructors in 175 high schools in California. This service program to secondary schools includes such activities as: The using of faculty members to visit schools to discuss with teachers and students, dairy, animal husbandry, crops, poultry, farm mechanics, and other agricultural problems; the writing of articles by instructors for agricultural magazines; the corresponding by the faculty members to advise high school departments on the solution of problems; the judging of livestock, poultry, and other products at fairs; the furnishing of breeding stock and hatching eggs to improve the herds and flocks of Future Farmers throughout the State; the preparing of teaching aids, such as film strips, price charts, blueprints, photographs, and economic analyses; and the holding of annual conferences on the campus.

Through the State Director of Vocational Education, the staff is kept constantly in touch with new developments in agricultural education, business education, trades and industries, distributive education, and homemaking education.

SUMMER QUARTER

California State Polytechnic College offers a summer quarter for old or new students. Summer quarter offerings make it possible for a student to shorten the overall length of time necessary to complete a prescribed curriculum.

The summer quarter is divided into two six-week periods, which is equal to the regular twelve-week period of the fall, winter, or spring quarters. However, a student attending the summer quarter has the option of taking either the first or second six-week period, or both.

A minimum load for the total summer quarter is the same as for other quarters. A student must carry a minimum of six quarter units per six-week period, which is equivalent to the 12-unit minimum required in the fall, winter, or spring quarters.

Admission requirements, fees and deposits, and other regulations are the same for the summer quarter as for the other three quarters of the school year.

IN-SERVICE PROGRAM

The college is also the in-service training center for vocational agriculture teachers. During a special summer session, which is not to be confused with the regular summer quarter, courses in skills and professional improvement are offered under the joint sponsorship of the California State Polytechnic College and the State Bureau of Agricultural Education. In addition, the annual conference of the California Agricultural Teachers Association is held on the campus.

EXTENSION COURSES

Extension courses on a college level may be given at various centers throughout the State in certain specialized fields, at such times as demand requires and instructors are available. Credits obtained in such courses may be applied toward meeting credential requirements for special fields of vocational education.

Full information concerning the extension course system will be sent on request.

ACCREDITATION

California State Polytechnic College is fully approved as a four-year degree-granting institution by the Northwest Association of Secondary and Higher Schools, and the Western College Association.

The college has been granted regular reaccreditation by the State Board of Education to give the training and to make the recommendation for the following credentials:

Special Secondary Credential in Vocational Agriculture

Special Secondary Limited Credential in Agriculture

Special Secondary Credential in Physical Education

General Secondary Credential with majors in: Agriculture, Health and Physical Education, Life Science and General Science, Mathematics, Physical Science and General Science, and Social Studies.

THE ALUMNI ASSOCIATION

The California State Polytechnic College Alumni Association is divided into six geographical regions, with a vice president for each region. These regions are:

Sacramento Valley made up of Placer, Sutter, Colusa, Yuba, Nevada, Sierra, Butte, Glenn, Tehama, Plumas, Lassen, Shasta, Modoc, Siskiyou, and Trinity Counties.

North Coast made up of Napa, Marin, Sonoma, Lake, Mendocino, Del Norte, and Humboldt Counties.

Central made up of Calaveras, Alpine, Amador, Sacramento, San Joaquin, Contra Costa, Solano, Yolo, El Dorado, Mono, Mariposa, Merced, Stanislaus, and Tuolumne Counties.

South Coast made up of Alameda, San Francisco, San Mateo, Santa Cruz, Santa Clara, San Benito, Monterey, Santa Barbara, and San Luis Obispo Counties.

San Joaquin Valley made up of Kern, Kings, Fresno, Tulare, and Madera Counties.

Southern made up of Ventura, Los Angeles, San Bernardino, Riverside, Orange, Imperial, San Diego, and Inyo Counties.

Affairs of the association are under the supervision of a Board of Directors, consisting of the president and secretary-treasurer of the state association, the vice president of each region, the past president of the state association, and an ex-officio member appointed by the President of California State Polytechnic College to represent the college.

Further to promote the activities of the association, a committee of 31 has been established, consisting of a state-wide chairman appointed by the president of the association, the six vice presidents, and four members from each of the regions.

The association publishes *The Green and Gold Alumni Review* four times each year. This is the official publication of the association aimed at keeping the membership informed of its activities, the latest happenings at the college, and news briefs about individual members.

The California State Polytechnic College at San Luis Obispo is the official headquarters of the association, and inquiries may be addressed there to obtain information relative to membership and other matters pertinent to the association. In the Southern region inquiries may be directed to the Voorhis Unit at San Dimas.

HEALTH AND MEDICAL SERVICE

Each student enrolled pays a medical fee, which is \$3 per quarter. The service provided consists of a physical examination, all minor and major surgery free, not including the service of any specialists. In addition, the service includes visits to students' homes and first aid treatment within a radius of five miles of the campus. Diseases of a chronic nature which the student contracted before entering school are not covered. The physician and surgeon is on the campus two hours daily, five days a week in the infirmary. Students may consult him at his office any time by appointment.

The college maintains a well-equipped infirmary which includes a 12-bed ward and four individual rooms. A registered nurse is on duty at all times. Students are generally required to pay fifty cents per day while they are in the infirmary. In the event that special hospitalization is required, students may enter any one of three hospitals located in San Luis Obispo. The student, in turn, must pay for any hospitalization which is required.

Registration is not complete until a student has completed the physical examination satisfactorily.

STUDENT COUNSELING CENTER

The Student Counseling Center offers service to any student or to any prospective student. This service consists of educational, vocational, and personal counseling in accordance with the needs of the student. An Occupational Library is maintained, and there is also opportunity to visit a number of departments to explore the type of activity carried on. Each student is assigned an adviser when he enrolls at the college.

PLACEMENT

The primary objective of all instruction at California State Polytechnic College is placement, either in a position as an employee, or in an agricultural or industrial enterprise owned and operated by the graduate. Employment in teaching is now receiving greater emphasis because of an increased demand for teachers.

The placement function is the joint responsibility of department heads and the placement secretary. All phases of the student's preparation and experience are considered by the placement secretary as the basis for making effective placement.

No guarantee of placement is made to any student, but a sincere effort is made to find employment for everyone who shows himself worthy of this service.

The institution has been successful for a number of years in placing all or virtually all of its recommended graduates. Not only is placement attempted by the college for each graduate, but men so placed are contacted often. An effort is made to see whether both employer and employee are satisfied, and whether advancement is being made. Better positions in other firms are often found for students who have been doing satisfactory work for a sufficient period to justify advancement.

CAMPUS EMPLOYMENT

In addition to the opportunities for students to earn money through project activities to assist them in meeting expenses, California State Polytechnic College has established a policy of giving a maximum number of students experience by employing them to operate the entire campus and farm. The average earning per student is several times as great as in the typical college where adults are employed full-time to do a large part of the kind of work done by students here. During normal years, California State Polytechnic College employs very few adult gardeners or janitors, no dining hall help except cooks, and only two farm foremen who work with students in maintenance, repair, and farm operation of equipment.

Not only does the college make every effort to place students in employment both on and off the campus, but it seeks to correlate this outside work with the student's major course of study. Students of electrical industries aid in operation of the power plant. Majors in the field of dairying feed and care for the college's dairy herd, milk the cows, and operate the milk plant. Students in ornamental horticulture maintain and improve the lawns, trees, and shrubbery.

OFF-CAMPUS EMPLOYMENT

The college works in cooperation with the California State Employment Service and the local towns-people in finding employment for students working their way through school. Usually this employment consists of odd jobs, although some steady part time work is obtained.

CAMPUS ORGANIZATIONS

Clubs and organizations on the San Luis Obispo campus cover all departments and activities, and the opportunity exists for every student to take an active part in club life. The presidents of the various social clubs and societies form an interclub council which has direct representation in student government. There are nearly 20 departmental clubs in addition to more than 10 social clubs and societies. These numbers do not include the dormitory clubs for students residing in dormitories, which number nearly 20.

STUDENT BODY GOVERNMENT

Any enrolled student of the California State Polytechnic College is eligible for active membership in the student body association, known as the "Associated Students of the California State Polytechnic College," at San Luis Obispo. The government and direction of the Associated Students and the control of its property is vested in the Student Affairs Council, members of which are selected according to regulations established in the student body constitution.

Benefits and privileges to members of the Associated Students include admission to all student body sponsored activities, such as athletic contests, music activities, and social functions, free or at reduced rates as prescribed by the Student Affairs Council; subscription to the weekly publication, *El Mustang*, and one copy each year of the yearly publication, *El Rodeo*, free or at a reduced rate as prescribed by the Student Affairs Council.

Dues for membership in the Associated Students are prescribed by the Student Affairs Council, subject to approval of a majority vote of the Associated Students.

ATHLETICS

Intercollegiate competition centers primarily around the activity of the California Collegiate Athletic Association; this college is a member along with Fresno State College, Santa Barbara College of the University of California, San Diego State College, Los Angeles State College and Pepperdine College. Competition is maintained in football, basketball, baseball, track, boxing, wrestling, gymnastics, fencing, swimming, badminton, tennis, and golf. There is a high level of competition in all sports. It is possible to earn a major letter award in any sport. Freshman teams are maintained in football, basketball, baseball, and track.

Year-around competition is offered in the intramural sports program and is open to all interested students or faculty; there are numerous teams entered in all sports. Medals are awarded winners in touch football, track, horseshoes, basketball, volleyball, swimming, boxing, wrestling, badminton, softball, tennis, and golf.

The Department of Health and Physical Education offers for all physical activities designed to provide a sound program of recreation, education in physical skills, and the give-and-take of games. Varsity teams in 12 intercollegiate sports offer opportunity for the more skilled. There are limited freshman schedules in four sports. Intramural teams provide year-around competition in a dozen sports at an easier level of play to all who wish to enter.

PUBLICATIONS

Publications of the student body at the California State Polytechnic College, San Luis Obispo, are not only written and edited by students, but are also printed in the college's own print shop as laboratory work for students majoring in printing. Editorial and photographic work on the publications is done by students of the journalism classes.

El Mustang—the official publication of the associated students of the San Luis Obispo campus, published once each week during the school year.

El Rodeo—the yearbook of the San Luis Obispo campus.

Other publications include a Poly Royal pictorial, Freshman Handbook, and other miscellaneous publications. The California Future Farmer magazine, a monthly magazine supported by and mailed to the 10,000 Future Farmers of America members in nearly 200 California high schools, is published on the campus.

POLY ROYAL

Each year, during the spring, the California State Polytechnic College, San Luis Obispo, has an open-house exhibition and show conducted by the associated students. This event is known as the Poly Royal, "a country fair on a college campus." Its purpose is to display the work accomplished during the year by the students, particularly student-owned projects. Each department of the college prepares its own display, and the show is on a competitive basis among the departments.

Besides the shows and exhibits, there are many entertainment features. Each year, the athletic department participates in either baseball or track with selected members of the California Collegiate Athletic Association. There are contests of interest to the general public, among which is an adult organization livestock judging contest, open to a team of three members from any recognized farm organization. One of

the main attractions is the Poly Royal Rodeo in which members of the student body compete in the usual rodeo events.

California State Polytechnic College, being noncoeducational, borrows a queen each year from some other college. This queen and her attendants are treated royally during the Poly Royal, and many social affairs honor them. In the past, queens have been provided by San Francisco State College, Fresno State College, San Jose State College, San Diego State College, Chico State College, and Humboldt State College.

SCHOLARSHIPS

FRESHMAN SCHOLARSHIPS

A number of freshmen scholarships are available at California State Polytechnic College for young men immediately after they have graduated from high school. In all cases, evidence must be submitted that additional financial assistance is necessary in order for the applicant to attend college. The applicant for these scholarships must be approved by the high school principal and one other instructor.

The sophomore and advanced scholarships are granted on the basis of performance of the individual in his work and activities at California State Polytechnic College.

Sears, Roebuck and Company State-wide Scholarship Awards

The Sears, Roebuck and Company offers 21 scholarships to California State Polytechnic College in two different groups; one group being "state-wide scholarships" and the other a "sophomore scholarship" award.

Deeply cognizant of the necessity of developing trained agricultural leadership in the Nation, and recognizing the splendid results in this field now being accomplished by California State Polytechnic College, Sears, Roebuck and Company wishes to broaden the availability of such training by offering scholarships to needy California farm boys of good character and capabilities who might otherwise be unable to enter college.

In carrying out this policy, Sears, Roebuck and Company has granted to California State Polytechnic College, 20 scholarships of \$100 each to be awarded to first-year students who enroll in agriculture for each school year.

The scholarship awards to applicants are determined on the basis of:

1. Financial need for assistance to continue his education.
2. Interest in agriculture and accomplishments as evidenced by his supervised home farm program.
3. Scholarship as shown on the transcript of high school credits, which shall include a statement of the number in the graduating class and the applicant's scholarship ranking in the class.
4. Citizenship and moral integrity, as certified by the high school principal, agriculture teacher, and others qualified to pass judgment on the applicant.

Application should be made through the local high school agriculture teacher, who will have all the necessary information. All candidates for these scholarships will be notified as to their status on or before August 15, 1947.

***South San Francisco and Stockton Union Stockyards Company Scholarship**

Two annual \$100 scholarships are awarded at the Cow Palace Spring Junior Livestock Show, on the basis of excellence of performance in the farm home program in the production of beef cattle, sheep, or hogs. Applicants are limited to those participating in this special event.

***Safeway Stores, Inc., Scholarship**

One annual \$100 scholarship is awarded at the Cow Palace Spring Junior Livestock Show, on the basis of excellence of performance in the farm home program in the production of beef cattle, sheep or hogs. Applicants are limited to those participating in this special event.

The Poultrymen's Cooperative Association of Southern California Scholarship

One annual scholarship of \$100 will be awarded to a prospective student who has had an outstanding home farm program in high school, and part of his home farm pro-

* These three scholarships go to outstanding Future Farmers for excellence in production of market livestock as demonstrated at the Cow Palace Spring Junior Livestock Show—one company giving the award to a beef producer, one to a lamb producer, and one to a swine producer. The type for which the particular scholarship is given rotates annually.

gram must have been with poultry. The applicant must be a resident of one of the following counties: Fresno, Kings, Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, San Diego, San Luis Obispo, or Ventura.

Washburn & Condon Scholarship

Washburn & Condon Livestock Commission Company of Los Angeles and San Francisco, has made available a \$100 scholarship to a resident of any part of California. This young man must have carried an outstanding home farm project that included the production for market of some beef animals, hogs, or lambs, or two or more of them. He must have graduated from high school and be eligible to attend California State Polytechnic College for the school year immediately following the awarding of this scholarship, and he must enroll in the Animal Husbandry Department. He should expect to engage in the production of market livestock after completing his education.

Challenge Creamery Scholarship

One annual scholarship of \$100 will be awarded to a Future Farmer student who excels in dairy production and who enrolls as a freshman in dairy industries at California State Polytechnic College. The applicant must be a resident of one of the following counties of California: Humboldt, Sonoma, Marin, Butte, Tehama, Colusa, Sutter, Glenn, San Luis Obispo, Merced, Fresno, Tulare, Kings, Los Angeles, San Bernardino, Imperial, or Stanislaus.

The E. C. Loomis and Sons Scholarship

One annual scholarship of \$100 will be awarded to the outstanding graduate in the high school vocational agriculture departments at San Luis Obispo, Arroyo Grande, Santa Maria, or Cambria.

National Association of Thoroughbred Breeders

One \$400 scholarship; \$200 at first year, \$100 during second and third years, to deserving Future Farmer student.

ADVANCED STUDENT SCHOLARSHIPS

Philip R. Park, Incorporated, Scholarship

The Philip R. Park, Inc., Naval Station, San Pedro, California, will award two \$100 scholarships to two worthy young men who have completed two years of outstanding work at this school in Animal Husbandry, Dairy Husbandry, or Poultry Production.

Rucklos Calcium Carbonate Company Scholarship

One annual scholarship of \$100 will be awarded to a worthy student of animal or dairy husbandry who has complete his freshman year at California State Polytechnic College.

W. P. Rucklos Scholarship

One annual scholarship of \$100 will be awarded to a worthy aeronautical student who has completed his freshman year at California State Polytechnic College.

Association of Maintenance Engineers

One annual \$100 scholarship to be awarded to a sophomore student on completion of his freshman year in maintenance engineering at California State Polytechnic College.

OTHER SCHOLARSHIPS

Carl Raymond Gray Scholarships

Four Carl Raymond Gray \$100 scholarships are made available by the Union Pacific Railroad, Omaha, Nebraska. Applicants must have completed two or more years of vocational agriculture, including commendable projects. One scholarship is to be awarded to one resident in each of the following counties: Los Angeles, Riverside, San Bernardino, and Orange. Scholarships may be used at California State Polytechnic College, University of California, or Chaffee Junior College. All applications, however, must be submitted not later than April 15th. Scholarships shall be used within the calendar year after the date of graduation from high school. All project books and a picture of the applicant and, if possible, pictures of his project, must accompany the application.

Sears, Roebuck and Company Sophomore Scholarship

The Sears, Roebuck and Company, as a continuation of the freshman scholarship plan already described, will award a \$200 sophomore scholarship to the most outstanding student of those receiving Sears, Roebuck awards as first year students.

Rotary Scholarships

Beginning with the school year of 1946-47, the San Luis Obispo Club of the Rotary International made available to California State Polytechnic College, two \$150 scholarships. These scholarships are to be awarded to students of outstanding ability in extracurricular activities. These students must carry a better than average grade record and must have at least a junior standing the fall quarter following the scholarship awards. The first awards were made in the spring of 1947.

Alumni Scholarship

Alumni and friends of the college have made available funds to be used for scholarships to students whose qualifications include: satisfactory scholarship, financial need, good character, and an interest in athletics. These scholarships may be from \$50 to \$150, on the approval of the Scholarship Committee.

STUDENT LOAN FUNDS

There are seven Student Loan Funds to assist temporarily worthy students. Loans from these funds are made for varying periods of time and are passed upon by faculty committee.

The character and integrity of the student are the primary qualifications for obtaining a loan, upon evidence of real need for such temporary assistance. Students who have spent funds far beyond the necessary school expenses will not be considered for loans, even though need is shown.

The Wrasse Fund

The principal source of loans is the Leopold Edward Wrasse Loan Fund, established by an elderly Fresno County farmer for the benefit of deserving boys desirous of an education and needing financial assistance. Approximately \$5,500 will be available for loans each year with the following general provisions:

1. First preference will be given to graduates of Caruthers High School in Fresno County, second preference to graduates of other high schools in Fresno County, and third preference to graduates of California high schools.

2. During the 12-months' period preceding the granting of the loan, the applicant must have earned through his own endeavor at least half of the amount of the desired loan, and must furnish evidence to this effect.

3. Interest will not be charged until graduation, or until the student ends his enrollment. Loans must be repaid within three years after the termination of enrollment.

The Rotary Club Fund

The San Luis Obispo Rotary Club has established a student loan fund open to any deserving student after one quarter of successful attendance. Applications are made through the business office.

The California State Polytechnic Women's Club Fund

The social club of women staff members and faculty wives at San Luis Obispo has established a student loan fund, increased each year by some type of public benefit. Loans are made to deserving students after one quarter of successful attendance.

Student Accommodation Loan Fund

The California State Polytechnic Women's Club and the Associated Students have set up a fund from which students may secure small short term loans.

Wilder Memorial Loan Fund

The Alumni Association sponsors the Wilder Memorial Loan Fund, from which small short term loans are made to deserving students.

Veterans Loan Fund

A short time loan fund has been established by the California State Polytechnic Women's Club for assisting needy veteran-students.

California Polytechnic Memorial Loan Fund

A loan fund has been established from the contributions made by numerous persons. It is designed to aid needy students where immediate financial assistance is needed.

ADMISSION, REGISTRATION, AND GRADUATION

ADMISSION REQUIREMENTS

It is the belief of the California State Polytechnic College Administration that the admission of a student to its classes and his progress through the institution, should be based upon demonstrated and continuing ability and interest, rather than on the completion of a previous pattern of courses under a different environment.

To substantiate this belief, experience has shown that students who have been required to complete a conventional college preparatory course sometimes do not receive best grades; but when confronted with courses involving the sciences and techniques of agriculture and industrial operations in which they are actively interested, they do very well.

The opposite is sometimes true, in that students of good intelligence may make excellent grades in preparatory schools, but when confronted with the need to demonstrate actual skills in technical courses, definitely lack such abilities and do not make successful students.

It is the objective of California State Polytechnic College to give a core of usable and job-getting information and skill courses, surrounded by required natural and social sciences, and complemented with such work in other than the major fields, as to produce graduates from the various curricula with the greatest amount of employability, training in living with others, and reasonable culture.

Therefore, admission to California State Polytechnic College for any of the various curricular levels is open to the graduate of any standard high school upon the submission of evidence of fitness to profit by college instruction, such fitness to be shown by previous scholastic records, by evidence of good moral character and personal qualifications, and by a satisfactory score on such tests as may be required.

Placement tests for the Engineering Division include English, mathematics, physics, to determine whether the students qualify for admission in degree English, college algebra, and college physics, which are prerequisites to enrolling in a major course on a degree level. Similar tests are given agriculture and science and humanities students to determine their proficiency in English, algebra, agricultural mechanics, and science. Preparatory courses are provided for students who need to "brush up" before enrolling in major work on the degree level.

Persons over 21 years of age who have not completed high school may be admitted as special students. Any veteran of World War II who served 90 days or more in the armed services may enter as a regular student whether he has completed high school or not.

In order to complete application for admission, a student must submit the following: First, the application for admission and, second, transcripts of all previous high school and college training. Each application for admission must be accompanied by a \$10 subsistence deposit.

Transcripts and records presented for admission or evaluation will remain in the student's folder as a part of his permanent record upon completion of registration by the student.

Individuals transferring from other colleges or universities who are allowed to enroll at California State Polytechnic College and who would have been on probation had they remained in the college or university, will be admitted to California State Polytechnic College on probation.

ADMISSION WITH ADVANCED STANDING

Persons who have attended junior colleges or four-year colleges will be given full credit for such courses as may be applicable to the pattern of course work in the curriculum followed.

Each application for admission with advanced standing will be considered upon its merits. In accepting work in the major field, the registrar will determine, by examination or otherwise, that the student has acquired the necessary skills in addition

to subject matter. Official evaluation of credit transferred to California State Polytechnic College will not be made until after a full year of residence is completed with at least a minimum load. Transfer credit is not allowed for a grade of D. Evaluation of in-service training will be made on the basis of American Council on Education recommendations.

No limit is placed upon the number of transferable credits, except that no student will be granted a Bachelor of Science degree in any of the various curricula with less than three full quarters of residence, two of which immediately precede graduation, nor with less than 50 quarter units of work received in residence at California State Polytechnic College. Also, no student will be granted a three-year technical certificate, a two-year technical certificate, or a two-year vocational certificate with less than two full quarters in residence immediately preceding graduation nor with less than 32 quarter units in residence. Transfer students, in their work taken at this college, must earn a number of grade points at least equal to the number of units attempted.

The date of graduation for students who do not meet all requirements at any June commencement will show on their permanent record as the closing date of the quarter in which all requirements are met. The student will then receive his diploma at the next annual commencement, or if he is unable to attend, the degree or certificate will be sent by mail. Only those students who have met all graduation requirements will be permitted to participate in the commencement exercises.

ADMISSION TO GRADUATE STANDING

Graduate work is definitely related to the teacher education program at California State Polytechnic College. Graduates of this college and of other institutions, having substantially the same requirements for the bachelor's degree, are eligible to apply to the Office of Admissions for admission to graduate standing.

The applicant must state what his credential objective is when he applies. For purposes of evaluation, his application must be accompanied by an official transcript of all previous college work. Such evaluation should be accomplished through correspondence previous to registration. After the applicant is issued a permit to register, a committee on graduate study will review the applicant's record and outline a program that will lead to the student's goal. This should be completed before the student registers in any course.

MASTER OF ARTS DEGREE

After a student has established graduate standing and pursued 15 quarter units of work approved for graduate credit with a grade point average of 1.75, he may apply to the Committee on Teacher Education for admission to candidacy for the Master's degree. Official forms may be secured from the Recorder's Office.

A graduate committee, consisting of a member from the student's field of concentration, a member from the Education Department (the Agricultural Teacher Trainer for Agricultural Education majors), and a third member chosen by the first two, shall be assigned to work out a program to meet the needs of each candidate and to conform to the requirements. The Department of Education member shall act as chairman of each committee and shall present to the Committee on Teacher Education an approved program of graduate study with each application for admission.

FIELDS OF GRADUATE CONCENTRATION

- | | |
|-----------------------|----------------------------------|
| 1. Agriculture | 4. Mathematics |
| 2. Physical Science | 5. Social Sciences |
| 3. Biological Science | 6. Health and Physical Education |

The program for the Master of Arts degree allows concentration in any of the above named fields, based on the undergraduate concentration.

CREDIT BY SPECIAL EXAMINATION, AND AUDITING

Regularly enrolled students are allowed the privilege of "challenging," or taking courses by special examination. Experience or previous training cannot be substituted for college credit. Individuals often enter the college, however, especially qualified in particular subjects. Individuals who feel that they are qualified to take any of the courses offered by special examination may do so under the following regulations:

1. Students desiring credit by examination in courses in which they are enrolled may request such an examination from the instructor at the beginning of the quarter. The instructor has the privilege of including written, oral, or practical tests, or a combination of all three types.

2. A student may receive a grade no higher than a B as a result of passing a course by examination.

3. Students desiring credit by examination in a course in which they are not enrolled may challenge it and take the special examination. A challenge fee of \$1 per unit will be charged. The following procedure will be followed in applying for special examinations:

- a. Report to the recorder's office and secure a special examination petition.
- b. Complete this petition, secure the signature of the instructor of the course, the signature of the registrar, and the signature of the dean of instruction. After the privilege of taking the special examination is granted, the student must pay the special examination fee of \$1 per unit, present the approval sheet to the instructor involved, and take the test.
- c. When the special examination petition is returned to the recorder's office by the instructor, it must be signed in full and must have attached a copy of the examination questions and the written examination, if it is a written examination; a list of skills in which the student was tested, if the examination was a practical examination; or a list of the questions, if the examination was an oral examination.

Regularly enrolled students are allowed to audit courses if they receive permission from the instructor in charge. Students will not receive units of credit nor grades for courses audited.

FEES AND DEPOSITS

State Fees and Deposits

Laboratory and Course Fees (quarter) -----	\$6.00
Breakage Deposit (year) -----	10.00
(All deposits refunded at end of year if there are no charges against student)	
Late Registration Fee -----	2.00
Late Return of Registration Cards Fee -----	2.00
Transcript Fee (no charge for first copy) -----	1.00
Evaluation of Record Fee (nonmatriculated students) -----	2.00
Course Challenge by Special Examination Fee (per unit) -----	1.00
Extension Course Fee (per unit) -----	1.00 or 5.00
Change of Program Fee -----	1.00
Failure to Meet Administratively Required Appointment -----	2.00

Other Fees and Deposits

Subsistence Deposit (all students, year) -----	\$10.00
(Unused portion refundable when student leaves school)	
Associated Student Card Fee (three quarters) -----	15.00
Post Office Box Rental (all students, per quarter) -----	.50
Medical Fee (per quarter) -----	3.00
Graduation Fee -----	7.50
(Must be paid at time application for graduation is submitted)	

NOTE: Fees for the summer quarter are identical to the fees for the other quarters.

LIVING EXPENSES

Room, per month (subject to change) ----- \$10.00
 (Must be paid quarterly in advance; students are required to furnish bed linen and blankets)

Board, per month (subject to change) ----- 40.00
 (Must be paid in advance)

Example of what the average student, not enrolled under Public Law 16, 346, or the California Veterans Educational Institute, pays at time of registration:

Subsistence Deposit -----	\$10.00
Breakage Deposit -----	10.00
Associated Student Card (per year) -----	15.00
Post Office Box Rental (per quarter) -----	.50
Medical Fee (per quarter) -----	3.00
Laboratory and Course Fee -----	6.00
Room Rent (per quarter) -----	30.00
Board (per month) -----	40.00
Books and Supplies (estimated) -----	30.00
	<hr/>
	\$144.50

Example of what the average student enrolled under Public Law 16, 346, or the California Veterans Educational Institute pays at time of registration:

Subsistence Deposit -----	\$10.00
Post Office Box Rental (per quarter) -----	.50
Room Rent (per quarter) -----	30.00
Board (per month) -----	40.00
*Books and Supplies -----	--
	<hr/>
	\$80.50

* If trainees have a Veterans Administration Letter of Entitlement when they register, books and supplies will be furnished. If they do not have the Letter of Entitlement, the trainee must pay for all fees, books and supplies until the time the letter is presented. There will be a refund made to the veteran when the letter is presented.

GRADUATION REQUIREMENTS**Degree Curricula****GENERAL REQUIREMENTS FOR GRADUATION**

All candidates for the Bachelor's degree shall have completed the requirements in one of the four-year curricula, shall have spent not less than three quarters in residence, two quarters immediately preceding graduation, shall have earned not less than 50 quarter units in residence, and shall have earned a total number of grade points at least equal to the number of units attempted.

Candidates from the engineering and industrial division must present a minimum of 212 quarter hours of credit for graduation. Candidates from the agricultural, and liberal arts divisions must present a minimum of 200 quarter hours of credit for graduation.

All candidates for the Bachelor's degree shall have completed the following:

1. Eleven hours of English, including nine hours of composition and two hours of public speaking.
2. Nine hours of political science and history, including three hours each of American government and Survey of U. S. History; and three hours chosen from Background of Modern Affairs or State and Local Government.
3. Twelve hours of physical science.
4. Three hours of family psychology.
5. Five hours of physical training, including two hours of health education.
6. Four-hour course in undergraduate thesis writing and an acceptable thesis.
7. Two hours of undergraduate seminar.
8. In addition, the graduation requirements of the division in which the major is selected and specific requirements of the departmental major selected.

DIVISION REQUIREMENTS FOR GRADUATION**Agricultural Division**

All candidates for the Bachelor's degree with a major in agriculture shall have completed, in addition to the general requirements, the following :

1. Four hours of organic chemistry.
2. Six hours of agricultural mechanics, including two hours in farm tractors. (Except for major in Dairy Manufacturing and Agricultural Inspection.)
3. Six hours in the principles of economics.
4. Six hours in accounting.
5. Six hours in agricultural economics, including three in agricultural prices and three chosen from among farm management, principles of marketing, cooperative marketing, agricultural resources, marketing control and governmental activity.
6. Five hours of mathematics.
7. Eight hours of soil science. (Except for major in Dairy Manufacturing or Poultry.)
8. Twelve hours of biological science determined by major selected. (Except for major in Agricultural Engineering.)

Engineering Division

All candidates for the Bachelor's degree with a major in engineering shall have completed, in addition to the general requirements, the following :

1. Eighteen hours of mathematics, including intermediate and college algebra, analytic geometry, differential calculus, and integral calculus.
2. Twelve hours of college physics.
3. Six hours of engineering drafting.
4. Nine hours of economics including industrial management, industrial economics, and industrial relations.

Liberal Arts Division

All candidates for the Bachelor's degree in the Liberal Arts Division shall have completed, in addition to the general requirements, the following :

1. Two hours of personal development.
2. Nine hours of literature.
3. Nine hours of principles of economics.
4. Six hours of college mathematics.
5. Six hours of general biology or equivalent.
6. Three hours of background of modern affairs and three hours of state and local government.
7. Five hours of general psychology.

Technical Curricula**GENERAL REQUIREMENTS FOR GRADUATION**

(The technical curricula are offered only in Agricultural, Engineering and Industrial divisions.)

Candidates for the technical certificate shall have completed the requirements in one of the three-year technical curricula, shall have spent not less than two quarters in residence immediately preceding graduation, shall have completed not less than 32 quarter units in residence, and shall have earned a total number of grade points at least equal to the number of units attempted.

Candidates from the engineering division shall present a minimum of 159 quarter hours of credit for graduation from the technical curricula. Candidates from the agricultural division must present a minimum of 150 quarter hours of credit for graduation from the technical curricula.

All candidates for the technical certificate shall have completed the following :

1. Nine hours of English.
2. Five hours of physical training, including two hours of health and hygiene.
3. Three hours of American government and two hours of American history.

DIVISION REQUIREMENTS FOR GRADUATION**Agricultural Division**

All candidates for the technical certificate with a major in agriculture shall have completed, in addition to the general requirements, the following:

1. Six hours in agricultural mechanics, including a minimum of two hours in tractor operations. (Except for major in Dairy Manufacturing.)
2. Six units in biological science, including three in botany and three in entomology, or three in animal biology and three in anatomy and physiology.
3. Twelve hours in economics, including three hours in economic problems, six hours in bookkeeping and accounting, and three hours in farm management.
4. Two hours of agricultural mathematics.
5. Four hours in soils.

Engineering Division

All candidates for the technical certificate for the major in engineering shall have completed, in addition to the general requirements, the following:

1. Nine hours of mathematics.
2. Nine hours in physics.
3. Six hours of machine shop.
4. Six hours of welding.
5. Six hours of engineering drafting.

DEPARTMENTAL REQUIREMENTS FOR GRADUATION

The requirements under the major departments are listed in the catalog under each department. Many courses in the technical curricula cannot be used to meet graduation requirements in any of the degree curricula. In the engineering division, the nine-hour mathematics requirement may be Mathematics 11, 12, 13. This series does not carry degree credit. Physics 11, 12, 13, which are nonlaboratory courses, will meet the physics requirement but do not carry credit toward meeting degree requirements.

Vocational and Two-year Technical Curricula**GENERAL REQUIREMENTS FOR GRADUATION**

Two-year curricula are offered both in the Agricultural and the Engineering Divisions. All candidates for these certificates shall have completed the first two years of any of the technical curricula, shall have spent not less than two quarters in residence immediately preceding graduation, shall have earned not less than 32 quarter units in residence, and shall have earned a total number of grade points at least equal to the number of units attempted.

Candidates from the engineering division shall present a minimum of 106 quarter hours of credit for graduation from the two-year technical curricula. Candidates from the agricultural division must present a minimum of 100 hours of credit for graduation from the vocational curricula.

All candidates for these certificates shall have completed the following:

1. Nine hours of English.
2. Five hours of physical training, with at least two hours in health hygiene.
3. Three hours of American government.

DIVISION REQUIREMENTS FOR GRADUATION**Agricultural Division**

All candidates for the vocational certificate with a major in agriculture shall have completed, in addition to the general requirements, the following:

1. Two units in agricultural mathematics.
2. Six units in biological science, including either three in botany and three in entomology, or three in animal biology and three in anatomy and physiology. (Except for major in Agricultural Mechanics.)
3. Six units in agricultural mechanics, including two hours of farm tractors. (Except for major in Dairy Manufacturing and Agricultural Inspection.)
4. Nine units in economics, including three in Economic Problems, three in Farm Bookkeeping, and three in Farm Management.

Engineering Division

All candidates for the vocational certificate with a major in engineering shall have completed, in addition to the general requirements, the following:

1. Nine hours of mathematics.
2. Nine hours of physics.
3. Six hours of machine shop.
4. Six hours of welding. (Except for major in Architecture or Radio.)
5. Six hours of drafting. (Except for major in Architecture or Radio.)

DEPARTMENTAL REQUIREMENTS FOR GRADUATION

The requirements under the major departments are listed in the catalog under each department. In the vocational and two-year technical curricula many courses in the major and related fields cannot be used to meet graduation requirements in any of the degree curricula. For example, the English listed under the general requirements for such curricula is Technical English. English Composition will substitute for Technical English, but Technical English will not substitute for English Composition. In the engineering division, the nine hour mathematics requirement may be Mathematics 11, 12, 13. This series does not carry degree credit. Physics 11, 12, 13, which are non-laboratory physics courses, will meet the physics requirement but do not carry credit toward meeting degree requirements.

REGULATIONS

ELIGIBILITY FOR INTERCOLLEGIATE ATHLETICS

Eligibility matters are under the jurisdiction of a faculty committee. In general, regulations are determined by conference rule. Salient points are noted below.

1. Competition is open to regularly enrolled students carrying at least 12 units and passing at least 10 units of college work.

2. Ten or more units and at least ten grade points must have been earned the last quarter of college residence preceding competition.

3. Only three years of varsity competition are allowed.

4. Freshmen and transfer students from four-year colleges must have a year of residence to be eligible. Thirty units complete this requirement for freshmen in football, basketball, track, baseball and other conference sports.

5. Junior college transfers are immediately eligible if previous credits satisfy requirements of the freshman rule. Two years of junior college competition are allowed, plus the three years of varsity competition.

CHANGE OF CURRICULUM

The objective of all training at California State Polytechnic College is to prepare the student for useful employment and for useful citizenship.

Our unique approach makes it mandatory for a student to carry work within his major as a freshman. By carrying this major work early in his program, it is much easier for a student to decide whether or not he enjoys and is fitted for the major he selected. Students who find that they are in a curriculum which does not provide the kind of training for which they have the greatest aptitude are encouraged to transfer to another curriculum as soon as the condition becomes apparent, rather than attempt to overcome an insurmountable handicap.

Transfer from one curriculum to another does not in any way change a student's academic standing. If an individual is on probation in one curriculum and decides to change to another, he will still be on probation under the new choice.

CHANGE OF PROGRAM

A period of 15 days of instruction, starting with the first day that classes are held, at the beginning of each quarter will be allowed for program changes.

After this 15-day period, no courses may be added to a student's program unless a request to do so is made by an instructor.

After the 15-day period for making program changes has ended, students who desire to withdraw from a course may do so by obtaining a "Permit to Withdraw From Courses" from the Recorder's Office. This permit must be properly filled out by the student and signed by the instructor. Before signing, the instructor will indicate whether the student is to receive a grade of F (failure) or W (withdrew) for the course. The grade of W indicates that the student is passing (Grade A to D) in the course at the time of withdrawal. The grade of F indicates that the student has done failing work up to the time of withdrawal.

A fee of \$1 will be charged for each program change except in cases where the change is being made upon the recommendation of the student's departmental adviser.

Students who withdraw from college prior to the end of the quarter shall receive a W or an F grade in each course depending upon whether passing or failing work had been accomplished up to the time of withdrawal.

Public Law 16 veterans should contact their Veterans Administration Training Officer before making any changes in their programs.

DOUBLE MAJORS

The student will normally meet graduation requirements for a degree or a certificate in one of the major departments. It is permissible for the student to have two majors indicated on his degree or certificate if the requirements of both curricula have been met.

A student who desires to submit only one thesis covering two closely related graduation majors must file a petition for special consideration prior to the last date for filing an application for graduation, as shown in the college calendar.

CLASS ATTENDANCE

Students are expected to be regular in attendance. It is the only way in which the quantity and quality of work may be kept high. Absence from classes is regarded as a very serious offense, and no excuses for work missed are provided.

An excused absence can be allowed only by the instructor in charge of the class upon consideration of the evidence justifying the absence presented by the student. An excused absence merely gives the individual who missed the class an opportunity to make up the work and does in no way excuse him from the work required.

GRADING SYSTEM

The following grading system is in effect :

A	-----	Superior
B	-----	Better than average
C	-----	Average
D	-----	Barely passing
E	-----	Incomplete
F	-----	Failure
W	-----	Withdrew from course without failure
NR	-----	No report received from instructor

Scholarship points are assigned to the various grades as follows :

For each unit of Grade A	—3 points
For each unit of Grade B	—2 points
For each unit of Grade C	—1 point
For each unit of Grade D	—0 point
For each unit of Grade E	—0 point
For each unit of Grade F	—0 point

Passing grades are marked by A, B, C, D. Grade E (incomplete) indicates a record below passing. It can be made up or completed without repeating the course in class by reexamination, or completing all unfinished work, or both, as the instructor may determine. The removal of Grade E entitles the student to the grade points he may have lost by the condition or failure, and in addition the number of grade points to which he may be entitled for his passing grade.

Grade E may be given to a student for the following reasons :

1. Passing in class work, but final examination not taken.
2. Passing in class work completed and in final examination, but some assigned work not completed.

If a grade of E is not made up to a passing grade during the next time the course is regularly offered, it will automatically revert to an F grade.

Grade F indicates failure. It is a record so poor that it can be raised to a passing grade only by repetition of the course. The grade of F shall remain on the permanent record, but the accompanying units attempted and the grade points lost will be disregarded if the course is subsequently retaken and passed.

If a P grade is given, it shall be considered a passing grade and allotted two grade points per unit.

The student may repeat a course in which a final grade of D has been received. The first grade earned for the course will remain on the transcript, but the units attempted and the grade points earned will be disregarded for grade point purposes.

Students may obtain grades by leaving self-addressed, stamped envelopes in the recorder's office at the end of the quarter, or by calling for them in that office.

MINIMUM GRADE REQUIREMENTS

Any student who fails to maintain a C average for any quarter (that is, does not have as many grade points as units undertaken) will be placed on probation for the succeeding quarter. Students on probation may have their activities curtailed until such time as their work is brought up to a C average.

Any student will become subject to dismissal from the California State Polytechnic College if he fails to maintain a C average when on probation, or if his record for any quarter falls below a D average.

Students doing failing work in any course will receive an unsatisfactory grade report at the six-week mid-term period and will be asked to report to their adviser or the dean of their division for counseling. Students who receive D or E grade notices at the end of the six-week mid-term period will be sent notices urging that they see their adviser regarding their low standing.

Students who have been dismissed because of low scholarship will not be admitted until at least one full quarter has elapsed and then only under certain conditions. These students must make application for readmission in writing directly to the president of the college. In applying for readmission, students must list reasons why they should be readmitted and present records of courses attempted or activities directed toward improving their chances for scholastic success. Students readmitted will enter on academic probation.

PERSONAL CONDUCT

Students whose personal conduct is unsatisfactory may be disqualified from certain activities or dismissed by the administration at any time. Unsatisfactory dismissals are issued to all students dismissed for misconduct, and a notation to this effect becomes a part of the students' permanent record.

All applications for readmission must be in writing and directed to the president of the college. Readmission will not be allowed sooner than one full quarter after date of dismissal. This readmission application must be accompanied by evidence of seriousness of purpose toward maintaining a satisfactory record of conduct. Individuals readmitted will be placed on probation pending proof of seriousness of purpose.

MAXIMUM AND MINIMUM LOAD

All students except those registered as "special" must be classified in one of the major departments of the college.

Students except those classified as "special" must register for not less than 12 or more than 20 quarter units of work; the only exceptions are made on the joint recommendation of the adviser, the division dean, the registrar, and the dean of instruction, whose signatures must be obtained by the student as he completes a Special Consideration form.

Minimum load requirements may be waived because of poor health or when only a few credits are needed for graduation. Maximum load requirements may be waived only on presentation of evidence of ability to carry successfully such a group of courses.

Veterans enrolled under Public Law 346 must enroll for a minimum of 12 quarter units to receive full subsistence pay. Veterans enrolled under Public Law 16 must enroll according to their assigned "occupational objective" and cannot change their courses or major unless permission is received from their Veterans Administration Training Officer.

CREDIT FOR MILITARY SERVICE

(Not applicable after July 1, 1951)

1. Nine quarter units of elective credit will be allowed toward graduation to any student submitting evidence of satisfactory completion of 15 weeks of training in the military service of the United States.

2. In addition to the nine quarter units under 1, 13½ quarter units of elective credit will be allowed toward graduation to any student submitting evidence that he has received a commission in the Army, Navy, Coast Guard, or Marine Corps. Maximum total credit possible toward graduation for military service is 22½ quarter units.

3. In allowing for credit for in-service training, California State Polytechnic College is following the recommendations of the American Council on Education in terms of units allowed and subject matter covered.

Military service credit may be used to meet the total requirements of five quarter units for Physical Education and Health Education.

Units allowed for in-service training will be awarded a C grade in cases where no record showing the actual grade earned can be presented.

REVISION OF CURRICULAR REQUIREMENTS

A student is not held for courses added to a curriculum in quarters which he has completed. A student shall meet the curricular requirements affecting quarters which he has not completed. Completion of a given quarter shall be computed upon a chronological basis.

APPLICATION FOR GRADUATION

Students shall make application for graduation in the recorder's office prior to the last date for filing such applications, as shown in the college calendar.

COURSE NUMBERING SYSTEM

The numbering system used is a three-digit system. Courses are grouped first into number series indicating the college level at which they are taught as follows:

- 1- 9—Preparatory courses
- 10- 99—Technical courses
- 100-199—Freshman courses
- 200-299—Sophomore courses
- 300-399—Junior courses
- 400-499—Senior courses
- 500-599—Graduate courses
- 600-699—Professional courses

The first digit indicates the level or year in which the courses are taught.

The second digit indicates the type of course with numbers assigned as follows:

- 0 or 1—Lecture courses
- 2 or 3—Courses involving both lecture and laboratory
- 4 or 5—Courses composed entirely of laboratory work
- 6 or 7—Undergraduate thesis or seminar
- 8 or 9—Graduate thesis or seminar

The third digit indicates the quarter in which the course is normally taught.

- 1, 4 or 7—Fall quarter courses
- 2, 5 or 8—Winter quarter courses
- 3, 6 or 9—Spring quarter courses

Numbers allowed to technical courses will be divided between the three years as follows. Because only two numbers are used, the first digit will indicate the year in which the course is given, and the second digit will indicate the quarter.

- 11-39—Freshman
- 41-69—Sophomore
- 71-99—Junior

NOTE: Courses numbered 1-99 carry no credit toward meeting degree requirements in any of the curricula.

Examples:

1. Eng. 101, 102, 103—A freshman English lecture series with one course offered in each of the quarters. Numbers Eng 104, 105, 106, or Eng 107, 108, 109, or Eng 111, 112, 113, or Eng 114, 115, 116, or Eng 117, 118, 119 could be used to indicate additional series of lecture courses offered in series in this field in the freshman year.

2. AH 121, 122, 123—A freshman animal husbandry series with one course offered in each quarter including both lecture and laboratory—Numbers AH 124, 125, 126, or AH 127, 128, 129, or AH 131, 132, 133, or AH 134, 135, 136, or AH 137, 138, 139 could be used to indicate additional series of animal husbandry lecture and laboratory combination courses provided in the freshman year.

3. Aero 141, 142, 143—A freshman laboratory or shop aero series with one course offered in each of the three quarters. Numbers Aero 144, 145, 146, or Aero 147, 148, 149, or Aero 151, 152, 153, or Aero 154, 155, 156, or Aero 157, 158, 159 could be used to indicate additional freshman series of aero laboratory courses.

4. Eng 1-2-3—A freshman series of English preparatory courses. Numbers Eng 4, 5, 6, or Eng 7, 8, 9 could also be used to indicate other freshman preparatory series.

SYMBOLS

The following symbols are used to indicate departments in which the courses are offered:

Aero—Aeronautical Engineering
 AC—Air Conditioning and Refrigeration Engineering
 AE—Agricultural Engineering
 AH—Animal Husbandry
 AgI—Agricultural Inspection
 Arch—Architectural Engineering
 Art—Art
 BSc—Biological Science
 CF—Citrus Fruit Production
 CP—Crops Production
 DH—Dairy Husbandry
 DM—Dairy Manufacturing
 Ec—Economics
 Ed—Education
 EE—Electrical Engineering
 EI—Electrical Industries
 EL—Electronic and Radio Engineering
 Eng—English
 FP—Deciduous Fruit Production
 Hist—History
 Jour—Journalism
 M—Maintenance Engineering
 Math—Mathematics
 ME—Mechanical Engineering
 Mu—Music
 OH—Ornamental Horticulture
 PE—Physical Education
 Pol Sc—Political Science
 Poul—Poultry
 Pr—Printing
 PSc—Physical Science
 Psy—Psychology
 SSc—Social Science
 SS—Soil Science
 TC—Truck Crops
 VS—Veterinary Science

PREPARATION FOR SECONDARY SCHOOL TEACHING

California State Polytechnic College is accredited by the State Board of Education to recommend for the following credentials:

Special Secondary Credential in Vocational Agriculture

Special Secondary Limited Credential in Agriculture

Special Secondary Credential in Physical Education

General Secondary Credential with majors in Agriculture, Health and Physical Education, Life Science and General Science, Mathematics, Physical Science and General Science, or Social Science.

GENERAL REQUIREMENTS OF CALIFORNIA STATE POLYTECHNIC COLLEGE FOR RECOMMENDATION FOR A TEACHING CREDENTIAL

Because of the wide and varied responsibilities placed upon teachers, the State of California and California State Polytechnic College consider that each candidate for a credential should complete a program which includes the broader aspects of human culture, as well as the knowledge and skills necessary to successful teaching in specific fields. An examination of the courses listed under general and division requirements will reveal that provision has been made for a study of: Democratic ideas and ideals of government, including intelligent comprehension of social, economic, and political conditions existing among nations and between the Nation and State; the types of work through which American citizens gain their livelihood; the basic laws of physical and mental health; processes and knowledge used in effective thinking; the social understanding and appreciation of the fine arts; and the role of science in improving human welfare.

As soon as a student feels that he has the personal qualifications essential to successful teaching, he should file with the Committee on Teacher Education an application for admission to the teacher training program.

In addition to this application he must at the proper time submit:

- A. A health certificate on the form prescribed by the State Board of Education.
- B. Evidence of the completion of three units of American Government and three units of American History or the passing of a comprehensive examination on the principles and provisions of the United States Constitution and American History.
- C. Evidence that the applicant meets the citizenship requirements established by the State Labor Code.
- D. Specified test results, including the areas of academic aptitude, English usage, current social problems, general culture, and interests. The tests will ordinarily be administered by the College during the course, Principles of Secondary Education (Ed. 301). The primary purpose of these tests is to inform the student of his achievement and abilities so that he can build on his strengths and eliminate his weaknesses. A secondary purpose is to help the college to appraise the student for selection, preparation, and placement purposes in order to produce the best possible teacher.
- E. Evidence of the completion with a grade point average of 1.5 of the requirements for the B.S. degree. Where graduate work is required for a credential, a grade point average of 1.75 is required for work taken in the graduate year.
- F. A program that includes the specific requirements for the credential for which the candidate is applying.

SPECIFIC REQUIREMENTS**The Special Secondary Credential in Vocational Agriculture**

An applicant for a California State Polytechnic College recommendation for a Special Secondary Credential in Vocational Agriculture must submit:

- I. Verification of A, B, C, D, and E under General Requirements.
- II. Three years of farm experience or its equivalent.
- III. A four-year college course with a bachelor's degree in agriculture, including:

	<i>Minimum Quarter Units</i>
A. Plant Production	23
B. Animal Husbandry	23
C. Agricultural Mechanics	12
D. Agricultural Economics	9
E. Total units in the above four fields.....	90
F. Eleven quarter units in education distributed as follows:	
	<i>Quarter Units</i>
1. Principles of Secondary Education.....	3
2. Educational Psychology	5
3. Teaching Plans and Techniques.....	3
G. Electives as approved by adviser.	

IV. One year of graduate work * including:

- A. Twenty-one quarter units of education, including:
 1. Curriculum and Methods in Vocational Agriculture..... 3
 2. Directed Teaching in Vocational Agriculture..... 12
 3. Electives from the following (select minimum of 6)

Audio-Visual Aids	3
Public School Administration.....	3
History and Philosophy of Education.....	3
Evaluation in Secondary Education.....	3
Counseling and Guidance in Secondary Schools.....	3
Adult and Continuation Education.....	3
Education Sociology	3
Seminar in Vocational Education and Guidance.....	3
- B. Additional courses in education as approved by the agricultural teacher-trainer.

The Special Secondary Limited Credential in Agriculture

An applicant for a California State Polytechnic College recommendation for the Special Secondary Limited Credential in Agriculture must submit:

- I. Verification of A, B, C, D, and E under General Requirements.
- II. A bachelor's degree with not less than 36 quarter units in agriculture, including:
 - A. Twelve quarter units of work in each of the specified subjects to be named on the credential. California State Polytechnic offers courses sufficient to meet these requirements in the fields of:
 1. Agricultural inspection
 2. Crops production
 3. Dairy husbandry and manufacturing
 4. Fruit production
 5. Ornamental horticulture
 6. Animal husbandry
 7. Poultry
 8. Agricultural engineering

* A minimum of 36 quarter units of work approved for graduate credit, taken after the student has been admitted to graduate standing.

B. Twenty-six quarter units of professional work in education, including:

	<i>Quarter Units</i>
1. Principles of Secondary Education.....	3
2. Educational Psychology	5
3. Teaching Plans and Techniques.....	3
4. Directed Teaching in Agriculture.....	9
5. Curriculum and Methods in Vocational Agriculture.....	3
6. Elective in Education.....	3

C. Other courses in education, the major, or the minor fields as approved by the adviser or agriculture teacher-trainer.**The Special Secondary Credential in Physical Education**

An applicant for a California State Polytechnic College recommendation for the Special Secondary Credential in Physical Education must submit:

I. Verification of A, B, C, D, and E under General Requirements.**II. A bachelor's degree including:****A. A minimum of 68 units in Health and Physical Education.****B. Twenty-nine quarter units of professional work in education, including:**

	<i>Quarter Units</i>
1. Principles of Secondary Education.....	3
2. Educational Psychology	5
3. Teaching Plans and Techniques.....	3
4. Directed Teaching in Physical Education.....	9
5. Curriculum and Methods in Health and Physical Education.....	3
6. Electives	6

C. Other courses in education, health and physical education, and electives approved by adviser.**The General Secondary Credential**

An applicant for a California State Polytechnic College recommendation for the General Secondary Credential must submit:

I. Verification of fulfillment of A, B, C, D, and E under General Requirements for a California State Polytechnic College recommendation for a credential.**II. A four-year college course with a bachelor's degree, including:****A. A minimum of 11 units in education as follows:**

	<i>Units</i>
1. Principles of Secondary Education.....	3
2. Educational Psychology	5
3. Teaching Plans and Techniques.....	3

B. Sixty units of general education including the following requirements or their equivalents:

1. General Biology	6
2. State and Local Government.....	3
3. Background of Modern Affairs.....	3
4. Literature, Communicative Arts such as Speech Arts, Languages, Journalism, Art, Music, and similar approved fields, but including at least 3 units in Literature.....	9
5. Economics	9
6. Mathematics	6

III. A. Completion of a teaching major (54 units minimum, of which at least 18 must be taken in the junior, senior, and graduate courses) in the field of agriculture, biological science, health and physical education, mathematics, physical science, or social science.**B. Completion of a teaching minor (minimum of 30 units) in a field in which majors are offered.**

- IV. One full year of graduate work of not less than 36 units, taken in residence after the student has been admitted to graduate standing at California State Polytechnic College. These units shall include:

	<i>Units</i>
A. Directed Teaching	9
B. Audio-Visual Aids (if not already taken)	3
C. Counseling and Guidance in Secondary Schools	3
D. Nine additional units selected from the following:	
1. History and Philosophy of Education	3
2. Public School Administration	3
3. Evaluation in Secondary Education	3
4. Adult and Continuation Education	3
5. Seminar in Vocational Education and Guidance	3
6. Educational Sociology	3
E. At least nine units in the major teaching field, including curriculum and methods in the major field.	
F. Other courses to complete minimum requirements in the teaching fields and for the graduate year.	

DEPARTMENTAL REQUIREMENTS FOR TEACHING MAJORS AND MINORS

In addition to the requirements I, II, and IV above, the candidate shall complete requirements for a teaching major and a teaching minor. The candidate should contact the department head or representative of the teaching major before registering for his junior year, for information concerning the integration of credential requirements with his graduation pattern.

AGRICULTURE—Teaching Major (90 units)

The requirements are the same as for the Special Secondary Credential in Vocational Agriculture.

AGRICULTURE—Teaching Minor (33 units)

	<i>Units</i>
Agricultural Mechanics (AE 121)	2
Anatomy and Physiology (VS 123)	3
(Prereq. BSc 131, 132)	
Feeds and Feeding (AH 101, 102)	4
Select one of the following sequences	12
Animal Husbandry 121, 122, 123	
Dairy Husbandry 121; Dairy Manufacturing 132; Dairy Husbandry 123	
Poultry 121, 122, 123	
Truck Crops 124, 125, 126	
Crop Production 121, 122, 123	
Fruit Production 131, 132, 133	
Ornamental Horticulture 121, 122, 123	
Three of the following general courses, outside of the major department selected above	12
Animal Husbandry 130	Truck Crops 230
Dairy Husbandry 130	Field Crops 220
Poultry 230	Fruit Production 230
General Nursery Practices 230	

BIOLOGICAL SCIENCE—Teaching Major (72 units)

First and Second Years

	<i>Units</i>
Survey of Physical Science (PSc 101, 102, 103)	12
General Botany (BSc 121, 122, 123)	12
General Zoology (BSc 131, 132, 133)	12

Third and Fourth Years		<i>Units</i>
Genetics (BSc 303)-----		3
General Chemistry (PSc 321, 322, 323)-----		12
Elective courses from Biological Science offerings and a maximum of nine units of the following applied courses-----		15
Animal Breeding (AH 304)-----	3	
(Prereq. VS 123, BSc 303)		
General Field Crops (CP 220)-----	3	
General Fruit Production (FP 230)-----	3	
General Truck Crops (TC 243)-----	3	
Plant Propagation (OH 101)-----	4	
General Nursery Practices (OH 230)-----	3	
General Poultry Production (Poul 230)-----	4	
Soils (SS 221)-----	4	
Anatomy and Physiology (VS 123)-----	3	
(Prereq. BSc 131, 132)		
Livestock Hygiene and Sanitation (VS 202)-----	3	
(Prereq. VS 123)		
Animal Parasitology (VS 203)-----	2	
(Prereq. BSc 131, 132)		
Animal Nutrition (AH 402)-----	3	
(Prereq. VS 123 and Chemistry)		

Graduate Year

Curriculum and Methods in Biological Science (BSc 521)-----	3
3 units from:	
Histology (BSc 522) or	
Plant and Animal Cytology (BSc 523)-----	3
Or other junior, senior, or graduate courses approved by adviser.	

BIOLOGICAL SCIENCE—Teaching Minor (36 units)

General Botany (BSc 121, 122, 123)-----	12
General Zoology (BSc 131, 132, 133)-----	12
12 units from any one of the 3 following sequences:	
General Chemistry (PSc 321, 322, 323) or	
Survey of Physical Science (PSc 101, 102, 103) or	
Chemistry (PSc 324, 325, 326)-----	12

HEALTH AND PHYSICAL EDUCATION—Teaching Major (58 units)

First and Second Years		<i>Units</i>
General Zoology (BSc 131, 132)-----		8
Safety and First Aid (PE 101)-----		2
Community Recreation (PE 106)-----		3
Swimming and Water Sports (PE 103)-----		2
Intramural Sports (PE 202)-----		3
Health Education (PE 203)-----		2
Third and Fourth Years		
Football Theory (PE 321)-----		2
Baseball and Softball Theory (PE 323)-----		2
Kinesiology (PE 302)-----		2
Track and Field Theory (PE 331)-----		2
Basketball Theory (PE 422)-----		2
Organization and Adm. of P.E. (PE 401)-----		3
Physical Education Activity (PE 341, 342, 343)-----		3
Tests and Measurements in P.E. (PE 411)-----		3
Elementary Physical Education Activity (PE 332)-----		3
Physiology of Exercise (PE 303)-----		2
Technique of Officiating (PE 311)-----		2
School Health Administration (PE 405)-----		2
Minor Sports Theory and Practice (PE 423)-----		3
Athletic Training and Massage (PE 432)-----		1

Graduate Year		Units
Completion of the following courses in Physical Education :		
Curriculum and Methods in Health and P.E. (PE 403)		3
Corrective Physical Education (PE 406) or		
Advanced Personal Hygiene (PE 512)		3
Other courses approved for graduate credit		

HEALTH AND PHYSICAL EDUCATION—Teaching Minor (30 Units)

First and Second Years		Units
Physical Education (PE 141, 142, 143, 241, 242, 243)		3
Health and Hygiene (PE 107)		2
Community Recreation (PE 106)		3
Intramural Sports (PE 202)		3
Health Education (PE 203)		2
Safety and First Aid (PE 101)		2

Third, Fourth, or Fifth Years

Minor Sports Theory and Practice (PE 423)	3
Organization and Adm. of Phys. Ed. (PE 401)	3
Curriculum and Methods in Health and Phys. Ed. (PE 403)	3
Electives—6 additional units selected from the following:	6
Football Coaching Theory (PE 321)	2
Basketball Coaching Theory (PE 422)	2
Baseball Coaching Theory (PE 323)	2
Track and Field Coaching Theory (PE 331)	2

MATHEMATICS—Teaching Major (54 units)

(18 units of the 54 must be in applications of mathematics)

First and Second Years		Units
Intermediate Algebra (Math 107)		3
College Algebra (Math 108)		3
Analytic Geometry (Math 109)		3
Differential and Integral Calculus (Math 201, 202, 203)		9

In addition, at least 3 units from the following :

* Elementary Engineering Problems (Math 213)	2
* Mathematics for Printers (Math 105)	3
* Agricultural Mathematics (Math 102, 103)	2 or 3
* Surveying	2, 4, or 6
Trigonometry (Math 106)	3
* Descriptive Geometry (ME 125, 126)	6
* Slide Rule (Math 104)	1
* First course in Statistical Methods (Math 211)	3

Third and Fourth Years

Differential Equations (Math 301, 302)	4
Theory of Equations (Math 307, 308)	6
* Secondary School Mathematics (Math 402, 403)	6
* Engineering Problems I (Math 313)	3

In addition, at least 5 units from the following :

Differential Equations (Math 303)	2
Non-Euclidean Geometry (Math 401)	3
* Engineering Mechanics (PSc 201)	3
* Engineering Problems II (Math 411)	3
Advanced Calculus (Math 412, 413)	3 or 6
Undergraduate Thesis and Seminar (Math 461, 462, 463)	6

* Applied courses.

Completion of:	Graduate Year	Units
* Curriculum and Methods in Mathematics (Math 521)-----		3
3 units from the following:		
Introduction to Theory of Functions of Complex Variable (Math 500)-----		3
Vector Analysis (Math 502, 503)-----		4
Foundations of Mathematics (Math 510)-----		3
Seminar (Math 580)-----		3
3 units from any junior, senior, or graduate mathematics course approved by adviser.		

MATHEMATICS—Teaching Minor (30 units)

	First and Second Years	Units
Intermediate Algebra (Math 107)-----		3
College Algebra (Math 108)-----		3
Analytic Geometry (Math 109)-----		3
Differential and Integral Calculus (Math 201, 202, 203)-----		9
Third and Fourth Years		
* Secondary School Mathematics (Math 402 or 403)-----		3
In addition, 6 units from the following:		
Differential Equations (Math 301, 302, 303)-----	2, 4, or	6
Theory of Equations (Math 307, 308)-----	3 or	6
* Engineering Problems I (Math 313)-----		3
Non-Euclidean Geometry (Math 401)-----		3
* Engineering Mechanics (PSc 201)-----		3

Graduate Year

3 units selected from the following:

* Curriculum and Methods in Mathematics (Math 521)-----	3
Vector Analysis (Math 502, 503)-----	4
Foundations of Mathematics (Math 510)-----	3
Any junior or senior mathematics course-----	3

PHYSICAL SCIENCE—Teaching Major (68 units)

	First and Second Years	Units
General Physics (PSc 131, 132, 133)-----		12
General Chemistry (PSc 321, 322, 323)-----		12
Sound (PSc 202)-----		3
Light (PSc 223)-----		3
Construction of Laboratory Glassware (PSc 243)-----		1
Machine Shop (ME 141, 142)-----		2
Analytic Geometry (Math 109)-----		3
Differential and Integral Calculus (Math 201, 202, 203)-----		9
Third and Fourth Years		
Organic Chemistry (PSc 326)-----		4
Quantitative Analysis (PSc 331)-----		4
Electives from the following applied courses:-----		6
Soils (SS 221)-----		3
Engineering Mechanics (PSc 201)-----		3
Strength of Materials (ME 202)-----		3
Internal Combustion Engines (ME 101)-----		3
Direct and Alternating Current Circuits (EE 223, 208, 209)-----	10	
Survey of Electronics and Radio (EL 111, 112, 113)-----		6
Fluid Flow (ME 311, 312)-----		6
Heat Transfer (ME 313)-----		6
Other courses approved by adviser		

* Applied courses.

Graduate Year	Units
Curriculum and Methods in Physical Science (PSc 521)	3
In addition select six units from the following :	6
Advanced Inorganic Chemistry (PSc 513)	3
Philosophy of Science (PSc 512)	3
Nuclear Physics (PSc 502)	3
Ag. Biochemistry (PSc 328)	3
Selected topics in Advanced Physics (PSc 501)	3
Other courses approved for graduate credit.	

PHYSICAL SCIENCE—Teaching Minor (37 units)	Units
General Physics (PSc 131, 132, 133)	12
General Chemistry (PSc 321, 322, 323)	12
A minimum of 10 units selected from the following courses, not more than 8 units of the minimum to be selected from either physics or chemistry.	
Sound (PSc 202)	3
Light (PSc 223)	3
Engineering Mechanics (PSc 201)	3
Quantitative Analysis (PSc 331, 332)	4 or 8
Organic Chemistry (PSc 326)	4
Ag. Biochemistry (PSc 328)	4

Graduate Year	
Three units selected from the following :	
Curriculum and Methods in Physical Science (PSc 521)	3
Other courses offered in teaching major, graduate year.	

SOCIAL SCIENCE—Teaching Major (57 units)	
First and Second Years	Units
History of Civilization (Hist 101, 102, 103)	9
Contemporary Civilization (SSc 201, 202, 203)	9
American Government (PolSc 301)	3
Principles of Economics (Econ 201, 202, 203)	9
Third and Fourth Years	
* History of the United States (Hist 301, 302, 303)	9
† Background of Modern Affairs (Hist 305)	3
State and Local Government (PolSc 401)	3
Agricultural Resources (Econ 305)	3

Graduate Year	
Curriculum and Methods in Social Science (SSc 521)	3
Three units from each of the following 2 groups:	6
1. Sources in Social Science (SSc 504)	3
Seminar in History of the Far East (Hist 502)	2
Seminar in Economic History of the United States (Hist 501)	2
Commercial Law (Econ 316)	3
2. Cooperative Marketing (Econ 402)	3
Industrial Relations (Econ 412)	3
Industrial Management (Econ 411)	3
Marketing Control and Government Activity (Econ 413)	3

* Hist. 304 will not substitute for any part of this requirement.

† Pol. Sc. 312 and 313 may be substituted for the requirement and three units of elective.

SOCIAL SCIENCE—Teaching Minor (30 units)

First and Second Years		Units
American Government (PolSc 301)-----		3
Third and Fourth Years		
* United States History (Hist 301, 302, 303)-----		9
† Background of Modern Affairs (Hist 305)-----		3
State and Local Government (PolSc 401)-----		3
Three units selected from the following:-----		3
Agricultural Resources (Econ 305)-----		3
Industrial Relations (Econ 412)-----		3
Industrial Management (Econ 411)-----		3
Cooperative Marketing (Econ 402)-----		3
Graduate Year		
Curriculum and Methods in Social Science (SSc 521)-----		3
Six units selected from the following:-----		6
Marketing Control and Government Activity (Econ 413)-----		3
Seminar in Econ. Hist. of U. S. (Hist 501)-----		2
Seminar in History of the Far East (Hist 502)-----		2
Sources in Social Science (SSc 504)-----		3

SELECTION OF CANDIDATES AND DIRECTED TEACHING

The college is of particular importance in the training program for prospective agriculture teachers and in-service teachers, and is approved by the State Board of Education for recommending qualified graduates for the Special Secondary Credential in Vocational Agriculture, the Special Secondary Limited Credential in Agriculture, the Special Secondary Credential in Physical Education, and the General Secondary Credential.

SPECIAL SECONDARY CREDENTIAL IN VOCATIONAL AGRICULTURE**Selection of Teacher Candidates**

The graduate or fifth year program, known as the "cadet year," is open to graduates of an agricultural college, who have a Bachelor of Science degree in agriculture and who meet all qualifications. In practice, most of the trainees are selected from two California agricultural colleges and are generally in contact with the teacher training staff during their senior year in college or before. The selection process is very rigid. All are weeded out except those with practical farming experience, good college records, and demonstrated abilities in leadership of farm youth. In common with the practices followed with teacher candidates seeking credentials, prospective vocational agriculture teachers submit their records and applications to the Committee on Teacher Training for evaluation.

Graduate or Fifth-year Program

Following the period of selection, the teacher candidates are enrolled for one year of training on the graduate level, with the specific provision and understanding that there will be a further evaluation and culling at the end of the first month, or at any other time during the training period when it appears that the candidate will probably not make a successful agriculture teacher.

This period is divided roughly into two parts—a period of time spent at California State Polytechnic College adding to technical proficiency and securing professional training through regular classes under the teacher training department and a period of time spent in a selected "critic center" under the careful supervision of an especially chosen, experienced vocational agriculture critic teacher.

It is essential that the vocational agriculture teacher have two basic assets—farming knowledge and teaching ability. In any group of teacher candidates entering the training period, there will be a wide range in their accomplishments and abilities

* Hist. 304 will not substitute for any part of this requirement.

† Pol. Sc. 312 and 313 may be substituted for the requirement and three units of elective.

from the individual with considerable teaching ability and perhaps some experience, but lacking farming skills and knowledge; to the individual with ability to perform correct agricultural practices, but lacking expertness in teaching techniques.

Under the California system, the proportion of time spent in skills acquisition and methods training, and the proportion of time spent in practice teaching under actual conditions and careful supervision, are maintained on a flexible basis, so that the individual "teacher-in-preparation" may be assigned a greater time to that type of training program most needed.

California is marked by its diversity of agricultural products, many of which are not produced in other states, and its specialization on the individual farm. The vocational agriculture teacher is usually required to have a working knowledge of about twenty-five to thirty important enterprises, calling for a wide variety of experience.

Because of California's unique agricultural situation, it is virtually impossible for even an experienced out-of-state agriculture teacher to enter vocational agriculture teaching in this State with knowledge and skills of sufficient variety to meet the California requirements. The in-service training program, described previously, gives the out-of-state teacher an opportunity to prepare himself to meet California conditions. Without exception, agriculture college graduates who have no teaching experience must avail themselves of the full fifth year cadet training program.

Directed Teaching and Teacher Supervision

"Critic centers" used for directed teaching consist of selected high school vocational agriculture departments located near the teacher training office. The teacher candidate becomes a regular member of the high school faculty, with very limited duties at first, while he principally observes the classroom procedure, lesson planning, and Future Farmer activities of the critic teacher who is his immediate supervisor. Only one or two teacher candidates are placed at a critic center, and their training program is arranged so that they gradually take over the class instruction and actually direct the activities of the department, under the guidance of the critic teacher. They have full charge of class discipline and Future Farmer meetings; they participate in extra-curricular events at the school; they meet parents of boys on home project supervision visits and make other contacts in connection with community affairs.

During the entire year, the teacher candidate is under the supervision of a member of the teacher training staff. This coordinator frequently visits the critic center, observes the practice teaching of the candidate, makes suggestions for improvement, and discusses the progress of the candidate with the critic teacher. Critic centers are located sufficiently close together that the candidates may be called together for frequent evening or Saturday meetings when additional training may be made available.

There is a threefold approach to the teacher training program at the college. The student enrolls in courses in professional education, agriculture, and through courses, work, and project experience learns the managerial problems of producers. The classes in agriculture are conducted by the regular college agricultural faculty, some of whom are former outstanding high school vocational agriculture teachers who know specifically the training most essential to high school agriculture teaching. Other faculty members, because of their own successful production experience, know the managerial problems of producers firsthand.

There are usually 25 to 30 candidates. About half of the group normally does critic teaching while the other half is in resident instruction at the college. At present the equivalent of two and one-half full-time teacher loads is devoted to the teacher training program, in addition to the services of the critic teacher and the other college faculty members who provide particularly the agricultural and managerial training. It may be emphasized that the graduate training program is an extensive one.

SPECIAL SECONDARY LIMITED CREDENTIAL IN AGRICULTURE

Selection of Teacher Candidates

Prospective teachers of nonvocational agriculture must submit their records and applications to the Committee on Teacher Training for evaluation. The selection process takes into consideration agricultural experience, college records, and demonstrated abilities in leadership.

The special secondary limited credential in agriculture entitles the holder to teach those agricultural subjects listed on the credential. Before a subject may be listed on the credential, the applicant must have completed a minimum of 12 quarter hours of work in each of the specified subjects to be named on the credential. For these reasons, the

work completed in the agricultural subjects are scrutinized closely by the Committee on Teacher Training.

Directed Teaching and Teacher Supervision

The directed teaching requirement will be met by assigning the candidate teaching responsibilities in his field in one of the agricultural teaching centers. Directed teaching may be completed in fall, winter, or spring quarters of the senior year. Assignment to teaching centers will depend on distribution of a candidate's load over the senior year, and activity within the teaching center.

The teacher candidate will be under the direction and observation of the "critic teacher" in the teaching center and the Committee on Teacher Education of California State Polytechnic College. Location of teaching centers has been arranged in high schools in areas near the college to facilitate close and careful supervision of teacher candidates.

SPECIAL SECONDARY CREDENTIAL IN PHYSICAL EDUCATION

Requirements for the special secondary credential in physical education may be completed in a four-year program. Athletic facilities, competitive programs, and intramural activities provide excellent opportunities for the prospective teacher of physical education and hygiene.

Selection of Teacher Candidates

Prospective teachers of health and physical education must submit their records and applications to the Committee on Teacher Education for evaluation. The selection process takes into consideration the scholastic and athletic records, and demonstrated ability in leadership, coaching and management of physical education and health programs. The individual's activity record is scrutinized very closely, because physical education and health teachers as a rule take a very active part not only in the physical education but also in the athletic program of high schools in California.

Directed Teaching and Teacher Supervision

The directed teaching requirement will be met by assigning the teacher candidate responsibilities in the field of physical education and health in one of the high school teaching centers. Supervision and training demanded by the comprehensive physical education intramural and competitive athletic program at the college provides many additional opportunities for teaching and supervisory experience previous to assignment to high school teacher training centers. Directed teaching may be completed during fall, winter, or spring quarters of the senior year.

The teacher candidate will be under the direct supervision and observation of the physical education and hygiene teachers in the teaching center, and the Committee on Teacher Education of the California State Polytechnic College.

GENERAL SECONDARY CREDENTIAL

Selection of Teacher Candidates

In the interest of the candidate, the Committee on Teacher Education reviews an applicant's record and secures from his instructors appraisals of his probable chances of success. The purpose is to insure that the investment of two or more years in teacher preparation is a wise one and to help the candidate realize his maximum potentialities. Further evaluation of his record is made when he applies for directed teaching and when he is finally recommended for the credential.

Directed Teaching and Teacher Supervision

Directed teaching for candidates for the General Secondary Credential will be conducted in the schools of the San Luis Obispo area. Supervision of this program will be by the representative of the student's major department who will also teach the course in Curriculum and Methods in the major subject. It will be necessary for the teacher candidate to spend one-half day for a full quarter in the high school teaching center. Ordinarily the candidate will be assigned a class in his major and a class in his minor, and will devote an additional hour each day to familiarizing himself with the other services required of secondary school teachers in their programs.

THE AGRICULTURAL DIVISION

The various curricula in the agricultural division are outlined and the courses described on the following pages. Each curriculum in the division follows a common pattern of related courses and a specific pattern of requirements within the major.

These curricula are so arranged that a student beginning as a freshman carries a large portion of major courses. This approach makes it possible for a student to determine in a rather short time whether or not he is fitted for the curriculum he has selected.

THE DEGREE CURRICULA IN AGRICULTURE

The degree curricula in agriculture include the following: Animal Husbandry, Agricultural Inspection, Agricultural Engineering and Mechanics, Crops Production, Truck Crops Production, Fruit Production, Citrus Fruit Production, Dairy Husbandry, Dairy Manufacturing, Ornamental Horticulture, Poultry Husbandry, Soil Science.

Students wishing to major in Agricultural Inspection or Citrus Fruit Production must complete the first two years of their program in attendance at the Voorhis Unit at San Dimas, California. Those interested in subtropical horticulture should spend the first two years in this major at the Voorhis Unit, San Dimas.

Electives in the degree curricula are few in number in the freshman and sophomore years and are increased in the junior and senior year. Electives may be chosen from among other agricultural fields, or they may be selected from courses listed under the Engineering or Liberal Arts Division.

Admission to the agricultural division demands high school graduation, but does not require specific pattern requirements. It is to prospective students' advantage, however, to enroll in the agricultural division with a good high school background in both physical and biological science.

TECHNICAL CURRICULA

In each of the agricultural majors, the three-year technical curriculum is provided. The essential differences between the technical curriculum and the degree curriculum are: First, the technical curriculum may be completed in three years; second, although the course requirements under the major selected are very similar, the technical student is required to take less work in the related fields and is allowed more elective time for specialization or for use at his discretion in preparing himself in his major.

These curricula have two distinctive functions. They make it possible for an individual to concentrate his efforts and activity in one of the agricultural majors and complete the work in minimum time. They also serve the needs of students who are not interested in the more advanced work of the degree curricula.

VOCATIONAL CURRICULA

In each of the agricultural majors a vocational certificate is awarded to individuals who satisfactorily complete the two-year vocational program. The vocational curricula are not tabulated separately, but in all cases in the agricultural division consist of the first two years work outlined under the technical curricula.

AGRICULTURAL ENGINEERING AND MECHANICS DEPARTMENT

Department Head, JAMES F. MERSON

RALPH O. BILLE
ERLE S. CAMPBELL
HENRY P. CLAY

JOHN E. DUNN
RALPH HOOVER
VERNON MEACHAM

M. RAY PARSONS
CLIVE REMUND
LEO SANKOFF

The function of this department is to train students in the proper design, selection, operation, construction, maintenance and repair of the wide variety of mechanical equipment used in modern agricultural practice, the design and construction of economical and sanitary farm buildings and structures, and the application of engineering methods to irrigation and to soil and water conservation.

Because of the extremely important part which mechanical equipment and labor saving devices play in the efficient operation of any farming enterprise today, the courses in this department have been designed to provide students of other departments, as well as those majoring in Agricultural Engineering, factual information and opportunity to learn by doing, under actual farm conditions, the numerous mechanical skills which they will need to carry on successfully any commercial farming enterprise.

Facilities

Full use is made of the 2,076 acre college farm as a laboratory where students get field practice in operating a fleet of some twenty tractors of all makes, types, and sizes, together with a full complement of modern farm machinery for every farming operation. Surveying, Irrigation, Soil Conservation, and Erosion Control classes use the various farm fields where real, rather than pseudo, problems motivate the work.

Classes in Farm Machinery and Tractors are conducted in a new all-metal building, 120 x 180 feet with a 60 x 60 foot wing. Excellent opportunity exists for students majoring in this department to obtain additional supervised experience in the servicing, maintenance, and repair of tractors and machinery in this modern shop.

Much of the equipment for the college, such as gates, feeders, watering devices, trailers, and small buildings, are designed, constructed, and repaired by the students in the other three agricultural engineering shops, each approximately 50 x 80 feet.

Other facilities include surveying, drafting, and hydraulics laboratories serving both the Agricultural Engineering Department and the Industrial Division.

Degree Curriculum

The degree curriculum in agricultural engineering includes a major pattern similar to that required under the agricultural division and a related pattern similar to that required under the engineering division. Students pursuing the degree curriculum in agricultural engineering must be prepared to carry mathematics and physics requirements identical to those in the engineering division.

Technical Curriculum

The technical curriculum in agricultural mechanics is a three-year program involving as much major work in agricultural engineering and mechanics as can possibly be included. The technical curriculum has been especially popular with those individuals who wish to prepare themselves for work in the agricultural mechanics field in three years. Both this technical and the following vocational curriculum follow a sequence of course majors and related work similar to that of other majors in the agricultural division.

Vocational Curriculum

The vocational curriculum is a two-year program, successful completion of which gives an individual a vocational certificate. This course is identical to the first two years of the technical program and has proved most valuable to men who must terminate their education in the minimum time of two years.

Placement

After graduation many students majoring in this department return, as owners or operators, to farms where specialized farming enterprises demand a great deal of mechanized equipment and a thorough knowledge of its maintenance and operation.

A number of graduates have been employed by government agencies, public utilities, irrigation districts, and other public service agencies where training in the engineering and mechanical phases of agriculture is necessary.

There is a constant and growing demand for graduates of this department by tractor and farm machinery manufacturers and dealers to fill positions as mechanics, as well as in the sales and service field.

DEGREE CURRICULUM IN AGRICULTURAL ENGINEERING

	F	W	S
Freshman Year			
Physics (PSc 131, 132, 133)-----	4	4	4
Algebra (Math 107, 108)-----	3	3	
Trigonometry (Math 106)-----			3
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2
Surveying (AE 131, ME 432)-----	2	2	
Engineering Drafting (ME 121, 122)-----	2	2	
Farm Tractors (AE 241)-----			2
Agricultural Mechanics (AE 121, 122)-----	2	2	
Welding (ME 154, 155, 156)-----	1	1	1
Machine Shop (ME 141, 142, 143)-----	1	1	1
Electives-----			3
	15 $\frac{1}{2}$	15 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
English Composition (Eng 104, 105, 106)-----	3	3	3
General Animal Production-----	4		
Analytic Geometry (Math 109)-----			3
Soils (SS 221)-----	4		
Soil and Water Conservation (SS 323)-----			4
Principles of Economics (Ec 201, 202)-----	3	3	
Cereal Crops (CP 122)-----		4	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Farm Machinery (AE 221, 222, 223)-----	2	2	2
Welding (ME 151, 152, 254)-----	1	1	1
Electives-----		3	3
	17 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$
Junior Year			
Engineering Mechanics (PSc 201)-----	3		
Strength of Materials (ME 202, 203)-----		3	3
Inorganic Chemistry PSc 324, 325)-----	4	4	
Organic Chemistry (PSc 326)-----			4
Public Speaking (Eng 201)-----			2
Farm Power (AE 327, 328, 329)-----	2	2	2
Farm Structures and Carp. (AE 321, 322, 323)-----	2	2	2
Rural Electrification (AE 331, 332)-----	3	3	
Irrigation (AE 325, 326)-----		3	3
Electives-----	2		2
	16	17	18
Senior Year			
General Accounting (Ec 301, 302)-----	3	3	
* Commercial Law (Ec 316)-----			3
General Plant Production-----	4		
Agricultural Prices (Ec 403)-----			3
American Government (Pol Sc 301)-----	3		
† State and Local Government (Pol Sc 401)-----			3
Survey of U. S. History (Hist 304)-----		3	
Family Psychology (Psy 403)-----			3
Advanced Agricultural Engineering (AE 421, 422, 423)-----	3	3	3
Undergraduate Thesis (AE 461, 462)-----	2	2	
Undergraduate Seminar (AE 463)-----			2
Electives-----	2	6	
	17	17	17

* Farm Management (Ec 303) may be substituted.

† Background of Modern Affairs (Hist 305) may be substituted.

TECHNICAL CURRICULUM IN AGRICULTURAL MECHANICS

	Freshman Year	F	W	S
English (Eng 11, 12, 13) -----		3	3	3
Mathematics for Technical Students (Math 11, 12, 13) -----		3	3	3
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----				2
Engineering Drafting (ME 121, 122) -----		2	2	
Surveying (AE 131, 132) -----			2	2
Farm Tractors (AE 241) -----		2		
Agricultural Mechanics (AE 121, 122) -----		2	2	
Welding (ME 154, 155, 156) -----		1	1	1
Machine Shop (ME 141, 142, 143) -----		1	1	1
Electives -----		2	2	4
		<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Sophomore Year				
Economic Problems (Ec 41) -----		3		
General Accounting (Ec 301, 302) -----			3	3
Physical Education (PE 241, 242, 243) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
General Plant Production -----		4		
General Animal Production -----			4	
Soils (SS 41) -----				4
American Government (Pol Sc 42) -----			3	
Farm Machinery (AE 221, 222, 223) -----		2	2	2
Welding (ME 151, 152, 254) -----		1	1	1
Electives -----		5	4	6
		<hr/> 15 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Junior Year				
Physics (PSc 11, 12, 13) -----		3	3	3
American History (Hist 41) -----		2		
* Commercial Law (Ec 316) -----				3
‡ Farm Structures and Carpentry (AE 321, 322, 323) -----		2	2	2
‡ Farm Power (AE 327, 328, 329) -----		2	2	2
Irrigation (AE 325, 326) -----			3	3
Rural Electrification (AE 331, 332) -----		3	3	
Soil and Water Conservation (SS 323) -----				4
Public Speaking (Eng 201) -----		2		
Electives -----		7	5	3
		<hr/> 17	<hr/> 17	<hr/> 17

VOCATIONAL CURRICULUM IN AGRICULTURAL MECHANICS

The first two years of the Technical Curriculum comprise the two-year vocational curriculum in Agriculture Mechanics.

DESCRIPTIONS OF COURSES IN AGRICULTURAL ENGINEERING AND MECHANICS DEPARTMENT**AE 1 Preparatory Agricultural Mechanics (2)**

One hour lecture, one three-hour laboratory; fall quarter; freshman year. A course in fundamental shop work for those students whose previous training is inadequate for AE 121. Tool sharpening and fitting, selection and use of common farm hardware, fundamental woodwork and cold metal work, sketching and reading working drawings, painting and glazing.

AE 121 Agricultural Mechanics (2)

One hour lecture, one three-hour laboratory; fall quarter; freshman year. Study and application of various mechanical skills important to agriculture, such as rope

* Farm Management (Ec 73 or Ec 303) may be substituted.

‡ Recommended for all vocational students in the sophomore year.

work, pipe fitting and sheet metal, metal work, and maintenance of farm electrical equipment.

AE 122 Agricultural Mechanics (2)

One hour lecture, one three-hour laboratory; winter quarter; freshman year. A study of production equipment for specific farming enterprises. Design, construction, and repair of farm gates and fences, feeding and watering devices, trailers, poultry and horticultural equipment, domestic water supply systems. Students should register for this course by sections according to their specific major.

Prerequisite: AE 121

AE 131 Farm Surveying (2)

One hour lecture, one three-hour laboratory; any quarter; freshman year. Selection, care, and use of tapes and levels. Introduction to mapping. Farm methods of land measurement and leveling with emphasis on running contour lines and ditch grades.

AE 132 Applied Farm Surveying (2)

One hour lecture and one three-hour laboratory, any quarter, freshman year. Practice in the use of levels, tapes, transits, plane tables, and alidades with emphasis on simple methods of contour mapping. Application of contour maps in the layout of irrigation and terrace systems. The calculation of cuts and fills for land leveling.

Prerequisite: AE 131

AE 221 Farm Machinery (2)

One hour lecture and one three-hour laboratory, fall quarter, sophomore year. A study of fertilizing equipment, spraying and dusting equipment, root crop harvesting machines, cotton and corn harvesting equipment, and seed cleaning equipment. Emphasis on the adjustment, field operation, and minor repairs of the machines studied.

Prerequisite: AE 122

AE 222 Farm Machinery (2)

One hour lecture and one three-hour laboratory, winter quarter, sophomore year. A study of seed bed preparation machinery, row crop planters, grain drills, cultivating and tillage machinery, and special cultivating equipment. Practical field operations, adjustments, and minor repairs.

Prerequisite: AE 122

AE 223 Farm Machinery (2)

One hour lecture and one three-hour laboratory, spring quarter, sophomore year. A study of harvesting machinery including corn binders, field choppers, silage cutters, and forage choppers. Hay harvesting equipment including mowers, rakes, stackers, balers, bale loaders, and special hay drying devices. Grain harvesting equipment including binder, windrowers, combines, special threshers, and bulk grain handling equipment. Emphasis placed on field operations, service, and minor repairs.

Prerequisite: AE 122

AE 230 Farm Blacksmithing (2)

One hour lecture and one three-hour laboratory, any quarter, sophomore year. Forge work designed for the farm blacksmith. Instruction in the use and repair of blacksmith tools and equipment. Projects in forging, using drawing, upsetting, bending, twisting, punching, welding, and tempering.

AE 241 Farm Tractors (2)

One four-hour lecture and laboratory combined, any quarter, sophomore year. This course includes the operation, servicing, and field adjustments on various makes, models and types of tractors, including gasoline, diesel, and butane equipment. Laboratory work consists of actual field operation with various kinds of farm implements.

AE 320 Parts and Inventory Control (2)

One hour lecture and one three-hour laboratory, winter quarter, junior year. This course is designed specifically for students planning to enter the farm equipment business. It deals with ordering parts, receiving, locating, disbursing, and inventory techniques. Types of equipment and forms used, arrangement of files and bins, methods of procedure, cross indexes and methods of maintaining a running inventory control are discussed.

Prerequisites: AE 221, 222, 223

AE 321 Farm Structures and Carpentry (2)

One hour lecture and one three-hour laboratory, fall quarter, junior year. A study of the design and construction of farm buildings and equipment. Use of the steel square. Typical farm buildings will be constructed by the class during laboratory periods.

Prerequisite: ME 121, AE 122

AE 322 Farm Structures and Carpentry (2)

One hour lecture and one three-hour laboratory, winter quarter, junior year. Estimating farm building costs, writing construction specifications, and preparing materials lists.

Prerequisite: AE 321

AE 323 Farm Structures and Carpentry (2)

One hour lecture and one three-hour laboratory, spring quarter, junior year. Farmstead layout. Basic requirements of farm buildings. Legal requirements. Building contracts. Calculation of load bearing capacities. Ventilation and insulation. Selection of equipment for farm buildings.

Prerequisite: AE 322

AE 325 Irrigation (3)

Two one-hour lectures, one three-hour laboratory; fall or winter quarter; junior year. An introduction to the problems and practices confronting the irrigation farmer. A study of soil moisture relationships, water measurements, methods of irrigation, water requirements, and irrigation and alkali.

Prerequisites: SS 221, AE 131

AE 326 Irrigation (3)

Two one-hour lectures, one three-hour laboratory; winter or spring quarter; junior year. A study of farm irrigation structures and distribution systems; irrigation pumps and pumping, including underground water supplies, size and rate of pumps, and kinds of pumps needed under various conditions; irrigation by sprinkling, including types, design, layouts, costs, and operation; and practice in field surveying and layouts.

Prerequisite: AE 325

AE 327 Farm Power (2)

One hour lecture and one three-hour laboratory, fall quarter, junior year. A study of the fundamental principles of the internal combustion engine and its use as a farm power plant. Laboratory practice consists primarily of trouble shooting, servicing, adjusting and overhauling various types of gasoline engines and their accessories.

Prerequisite: AE 241

AE 328 Farm Power (2)

One hour lecture and one three-hour laboratory, winter quarter, junior year. A study of the diesel engine and its various uses in agriculture. Laboratory practice consists of trouble shooting, servicing, adjusting and overhauling the various types of diesel engines used for farm power.

Prerequisite: AE 327

AE 329 Farm Power (2)

One hour lecture and one three-hour laboratory, spring quarter, junior year. A study of power transmission. Pulleys, belts, chains, sprockets, gears, brakes, clutches, etc., and their use in agriculture. Laboratory practice will consist of servicing and overhauling farm machines and tractors where these devices are used.

AE 331 Rural Electrification (3)

Two one-hour lectures and one three-hour laboratory, fall quarter, junior year. The fundamental principles of wiring farm buildings, basic circuits, protective devices, code regulations, materials used, and electrical rate schedules, together with practical laboratory work on typical farm installations.

AE 332 Rural Electrification**(3)**

Two one-hour lectures and one three-hour laboratory, winter quarter, junior year. The application of electricity to efficient farm operation through a study of various electrical devices. Installation and maintenance of brooders, soil heaters, sterilizers, and various types of electric motors.

Prerequisite: AE 331.

AE 421 Advanced Agricultural Engineering**(3)**

One hour lecture and two three-hour laboratories, fall quarter, senior year. A study of erosion control, drainage, and hydrology.

Prerequisite: ME 432, SS 323, AE 326.

AE 422 Advanced Agricultural Engineering**(3)**

One hour lecture and two three-hour laboratories, winter quarter, senior year. Major repair of farm machinery, with special emphasis on shop arrangement, shop records, flat rate estimates, appraisal of used machines, and other managerial aspects of repair shop operation.

Prerequisite: AE 329.

AE 423 Advanced Agricultural Engineering**(3)**

One hour lecture and two three-hour laboratories, spring quarter, senior year. Advanced study of farm buildings and structures. Design of loading platforms. Application of economic principles to building costs.

Prerequisite: AE 323.

AE 461, 462 Undergraduate Thesis**(2) (2)**

One two-hour meeting, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

AE 463 Undergraduate Seminar**(2)**

One two-hour meeting, spring quarter, senior year. The seminar course is designed primarily to assist students in keeping abreast of major developments in their chosen field. In addition to new developments, policies, practices, and procedures will be discussed through regular seminar. Each individual will be responsible for the development and presentation of a topic in his chosen field.

ANIMAL HUSBANDRY DEPARTMENT

Department Head, LYMAN BENNION

SPELMAN COLLINS

RICHARD JOHNSON

GEORGE MCNEELY

RALPH HOOVER

ROLLIN LANDER

HARRY PARKER

LYLE HOYT

ROBERT MILLER

The function of the Animal Husbandry Department is to train men for the occupation of farming where beef cattle, sheep, or swine production is practiced. It also prepares men for technical positions in livestock industries and trains for professional positions in agriculture dealing with the livestock industry, teaching, or federal and state positions.

Students enrolled in the Animal Husbandry Department are encouraged to carry supervised farming programs along with their regular major work. These programs under animal husbandry usually involve the feeding of either beef, sheep, or swine. The total animal husbandry project program includes production activities involving 250 head of beef cattle, 600 head of sheep, and 800 head of swine. Through student production projects alone during the past year, men enrolled in this department marketed fat animals valued at over \$75,000.

Facilities

Breeding herds are maintained on the campus, including 125 registered beef cows, 150 registered ewes, and 75 brood sows; three breeds of beef, three breeds of sheep, and three breeds of hogs are represented in these herds.

Buildings include beef breeding farm and steer shed, plus feed lots to accommodate 250 head of steers throughout the year; central swine farrowing house, and individual feeding pens to accommodate 75 brood sows and approximately 800 fat hogs throughout the year; sheep barns and feeding shed to accommodate the sheep breeding flock and approximately 500 fat lambs per year.

In addition to the pasture and hay land available on the campus farm, approximately 600 acres of additional land are leased for the use of the Animal Husbandry Department.

Degree Curriculum

A four-year program leading to a Bachelor of Science degree in agriculture with a major in animal husbandry is provided in this department. This four-year program includes major work beginning with the freshman year and covers instruction in the animal husbandry field in beef, sheep, and swine production and the appropriate related science courses to supplement the major work.

Although the approach in the degree curriculum is different from the usual approach, the total number of units required in the major and related fields is similar to the units required in other agricultural colleges.

Technical Curriculum

The three year technical program provided in animal husbandry gives one a three-year technical certificate upon completion of requirements. This technical program was devised to include a major program almost identical to that of the first three years of the degree curriculum but requiring the minimum in related work.

Vocational Curriculum

The two-year vocational curriculum is identical to the first two years of the three-year technical program. This curriculum was developed to meet the needs of those individuals who are interested in securing a maximum amount of animal husbandry training in the minimum time.

Placement

The Animal Husbandry Department trains primarily for placement in animal husbandry or similar fields. Degree graduates are often interested in the various positions open in fields closely associated to animal husbandry, in agricultural teaching, and in civil service positions with either the State of California or the Federal Government.

Technical and vocational graduates are usually placed in positions directly connected with the production of either beef, sheep, or swine. A number of these men have been placed as feeders of livestock or buyers of livestock and wool, and as assistants in breeding associations, and in feed, seed, and fertilizer houses.

Many graduates are now owners and operators of their own ranches.

DEGREE CURRICULUM IN ANIMAL HUSBANDRY

Freshman Year			
	F	W	S
English Composition (Eng 104, 105, 106) -----	3	3	3
Mathematics (Math 102, 103) -----		2	3
Agricultural Mechanics (AE 121, 122) -----	2	2	
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Project Records (Ec 100) -----	1		
Zoology (BSc 131, 132) -----	4	4	
Anatomy and Physiology (VS 123) -----			3
Feeds and Feeding (AH 101, 102) -----	2	2	
Market Beef Production (AH 121) -----	4		
Elements of Swine Production (AH 122) -----		4	
Elements of Sheep Production (AH 123) -----			4
Forage Crops (CP 123) -----			4
	<hr/> 16 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year			
Principles of Economics (Ec 201, 202) -----	3	3	
Farm Tractors (AE 241) -----			2
Soils (SS 221) -----			4
Health and Hygiene (PE 107) -----	2		
Public Speaking (Eng 201) -----		2	
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Farm Machinery (AE 222, 223) -----		2	2
Bacteriology (BSc 221) -----	4		
Livestock Hygiene and Sanitation (VS 202) -----		3	
Animal Parasitology (VS 203) -----			2
Sheep Husbandry (AH 221) -----	4		
Commercial Beef Production (AH 222) -----		4	
Market Swine (AH 223) -----			4
Genetics (BSc 303) -----			3
Electives -----	3	2	
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Junior Year			
Accounting (Ec 301, 302) -----	3	3	
* Farm Management (Ec 303) -----			3
General Inorganic Chemistry (PSc 324, 325) -----	4	4	
Organic Chemistry (PSc 326) -----			4
American Government (Pol Sc 301) -----		3	
Survey of United States History (Hist 304) -----			3
Animal Breeding (AH 304) -----	3		
Range Management (SS 321) -----	4		
Specialized Sheep Enterprises (AH 322) -----		4	
Swine Husbandry (AH 321) -----	4		
Beef Husbandry (AH 323) -----			4
Electives -----		3	2
	<hr/> 18	<hr/> 17	<hr/> 16

* Three units of economics to be selected from among the nine units listed.

	Senior Year	F	W	S
* Principles of Marketing (Ec 401)-----		3		
* Cooperative Marketing (Ec 402)-----			3	
Agricultural Prices (Ec 403)-----				3
Agricultural Biochemistry (PSc 328)-----	4			
Animal Nutrition (AH 402)-----			3	
Family Psychology (Psy 403)-----				3
† State and Local Government (Pol Sc 401)-----				3
Undergraduate Thesis (AH 461, 462)-----	2	2		
Undergraduate Seminar (AH 463)-----				2
Electives-----	6	8		5
	15	16		16

TECHNICAL CURRICULUM IN ANIMAL HUSBANDRY

	Freshman Year			
Technical English (Eng 11, 12, 13)-----	3	3		3
Agricultural Mathematics (Math 15)-----		3		
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$		$\frac{1}{2}$
Health and Hygiene (PE 107)-----				2
Project Records (Ec 100)-----	1			
Animal Biology (BSc 11)-----	3			
Introductory Anatomy and Physiology (VS 12)-----		3		
Agricultural Mechanics (AE 121, 122)-----	2	2		
Feeds and Feeding (AH 101, 102)-----	2	2		
Market Beef Production (AH 121)-----	4			
Elements of Swine Production (AH 122)-----		4		
Elements of Sheep Production (AH 123)-----				4
Forage Crops (CP 23)-----				4
Electives-----				3
	15 $\frac{1}{2}$	17 $\frac{1}{2}$		16 $\frac{1}{2}$
	Sophomore Year			
Economic Problems (Ec 41)-----	3			
Farm Bookkeeping (Ec 42, 43)-----		3		3
American Government (Pol Sc 42)-----		3		
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$		$\frac{1}{2}$
Farm Tractors (AE 241)-----				2
Soils (SS 41)-----				4
Principles of Livestock Hygiene (VS 41)-----	3			
Sheep Husbandry (AH 221)-----	4			
Commercial Beef Production (AH 222)-----		4		
Market Swine (AH 223)-----				4
Applied Genetics (BSc 19)-----				3
Electives-----	7	6		
	17 $\frac{1}{2}$	16 $\frac{1}{2}$		16 $\frac{1}{2}$
	Junior Year			
American History (Hist 41)-----	2			
Farm Management (Ec 73)-----				3
Specialized Sheep Enterprises (AH 322)-----		4		
Swine Husbandry (AH 321)-----	4			
Beef Husbandry (AH 323)-----				4
Animal Breeding (AH 22)-----		3		
Animal Parasitology (VS 203)-----				2
Electives-----	10	10		8
	16	17		17

* Three units of economics to be selected from among the nine units listed.

† Background of Modern Affairs (Hist 305) may be substituted.

VOCATIONAL CURRICULUM IN ANIMAL HUSBANDRY

The first two years of the Technical curriculum comprise the two-year vocational curriculum in animal husbandry.

DESCRIPTIONS OF COURSES IN ANIMAL HUSBANDRY**AH 22 Animal Breeding (3)**

Three one-hour lectures; winter quarter; junior year. Application of genetics to livestock breeding programs. Pedigree and herd book records. A consideration of breeding methods and artificial insemination.

AH 101 Feeds and Feeding (2)

Two one-hour lectures, fall quarter, freshman year. A study of the constituents of feeds, carbohydrates, proteins, fats, minerals, vitamins and water; their utilization by the animal body. The digestive system, the processes of digestion and assimilation of the various feed constituents. Computations of standard rations for livestock.

AH 102 Feeds and Feeding (2)

Two one-hour lectures, winter quarter, freshman year. A continuation of AH 101.

AH 121 Market Beef Production (4)

Three one-hour lectures, one three-hour laboratory; fall quarter; freshman year. A study of the breeds and market classes of beef cattle. The selection of feeder and fat cattle. Management practices in purchasing and fattening cattle for market. Marketing of home-grown crops through beef cattle. Study of cattle feeding operations carried on at the college through student projects. Marketing of slaughter cattle.

AH 122 Elements of Swine Production (4)

Three one-hour lectures, one three-hour laboratory; winter quarter; freshman year. Study of market and breed types of swine. Swine production in relation to other farming practices and as a means of marketing home-grown feeds and by-products. Practice in selecting the right type of hogs. Study of the student projects involving feeding, managing, and marketing of some 600 market hogs each year.

AH 123 Elements of Sheep Production (4)

Three one-hour lectures, one three-hour laboratory; spring quarter; freshman year. The types of sheep enterprises in the West, economic considerations of each and factors to be considered upon entering these businesses. Bases for selection of and practices in buying commercial sheep. Jobs in the sheep business. Laboratory work in judging, sheep handling, fitting and exhibiting, butchering, shearing and wool grading.

AH 130 General Animal Husbandry (4)

Three one-hour lectures and one three-hour laboratory; any quarter; freshman year. A general course dealing with selection, feeding and management of beef cattle, swine, and sheep in California. For other than Animal Husbandry majors.

AH 221 Sheep Husbandry (4)

Three one-hour lectures, one three-hour laboratory; fall quarter; sophomore year. Detailed instruction in management of sheep used for commercial milk-fat lamb production. The sheep year—preparations for breeding, the breeding period, the gestation period, lambing, lamb growing, sales and replacements. Control of disease. Laboratory work with the ewe band, the "drop bunch," and with commercially fed lambs.

AH 222 Commercial Beef Production (4)

Three one-hour lectures, one three-hour laboratory; winter quarter; sophomore year. The production of commercial beef cattle. The care and management of a breeding herd of commercial cattle in California. Range and farm lands suited to beef production. Improvement of beef cattle—factors affecting cost of production. Areas of beef production in California. Trends in the beef cattle industry.

Prerequisites: AH 102, AH 121, CP 123.

AH 223 Market Swine**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; sophomore year. Production of market swine to meet the present consumer demands, covering the channels of marketing, grades of hogs at the market, pork packing industries, and carcass grades. The feeding and cost of producing market hogs. Practice in selecting feeder pigs and market hogs.

Prerequisites: AH 122, AH 101, 102.

AH 234 Horseshoeing**(2)**

One-hour lecture and one three-hour laboratory combined; fall quarter; sophomore year. A study of the fundamentals of horseshoeing, anatomy and physiology of the horse's foot, pastern, and legs. Trimming feet, fitting and nailing shoes. Normal shoeing, corrective shoeing.

AH 304 Animal Breeding**(3)**

Three one-hour lectures; fall quarter; junior year. An introduction to the physiological basis of reproduction, parturition, and lactation. The application of genetics to animal breeding. A consideration of breeding methods, and artificial insemination.

AH 321 Swine Husbandry**(4)**

Three one-hour lectures, one three-hour laboratory; fall quarter; junior year. Breeding, feeding, care and management of swine. Special attention given to the handling of the breeding herd; the production, showing, and selling of purebred swine; judging and selecting of breeding stock.

Prerequisites: AH 122, AH 223, AH 101, 102.

AH 322 Specialized Sheep Enterprises**(4)**

Three one-hour lectures, one three-hour laboratory; winter quarter; junior year. The purebred and range ram business as it differs from the commercial milk-fat lamb business; analysis of requirements for success. The irrigated pasture lamb fattening business (Ladino clover, birdsfoot trefoil, alfalfa). The dry-lot lamb fattening business as carried on in California. Laboratory work through the lambing period, growing rams, and handling commercially fed lambs.

AH 323 Beef Husbandry**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; junior year. The purebred cattle industry. Breeding programs for purebred cattle. Selection of breeding stock. Pedigree. Facilities and equipment needed. Feeding breeding herd, show, and sale cattle. Marketing purebred cattle. Emphasis is placed on the management of the breeding herds of Hereford, Shorthorn, and Aberdeen Angus maintained by the college.

Prerequisites: AH 102, AH 121, AH 222, BSc 303, AH 304.

AH 326 Livestock Judging**(3)**

One-hour lecture and two three-hour laboratories; spring quarter; junior year. Training in the selection of beef cattle, sheep, swine, and horses according to breed, type, and utility. Designed to aid in practical selection of purebred or commercial herds.

Prerequisite: 24 units of Animal Husbandry.

AH 332 Elements of Horse Production**(3)**

Two one-hour lectures, one three-hour laboratory; winter quarter; junior year. Selection, feeding, management, and care of horses, with special emphasis on the Thoroughbred.

AH 333 Horse Husbandry**(3)**

Two one-hour lectures, one three-hour laboratory; spring quarter; junior year. Study of blood lines of the Thoroughbred and instruction in breeding practices.

AH 402 Animal Nutrition**(3)**

Three one-hour lectures, winter quarter; senior year. A study of the fundamentals of animal nutrition in regard to the metabolism of proteins, carbohydrates, fats, minerals and vitamins. The relationship of malnutrition and deficiency diseases to livestock production.

AH 441 Advanced Livestock Judging**(2)**

Two three-hour laboratories, fall quarter, senior year. Limited to 15 students selected for livestock judging teams.

Prerequisite: AH 326

AH 461, 462 Undergraduate Thesis**(2) (2)**

One two-hour meeting, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

AH 463 Undergraduate Seminar**(2)**

One two-hour meeting, spring quarter, senior year. The seminar course is designed primarily to assist students in keeping abreast of major developments in their chosen field. In addition to new developments, policies, practices, and procedures will be discussed through regular seminar. Each individual will be responsible for the development and presentation of a topic in his chosen field.

DAIRY HUSBANDRY AND DAIRY MANUFACTURING DEPARTMENT

Department Head, GEORGE M. DRUMM

KENNETH BOYLE

RUSSELL NELSON

The function of the dairy department is to prepare students in the occupation fields of dairy production and dairy manufacturing. The field of dairy production in California is one requiring considerable study because of the wide divergence in production methods between such areas as the Los Angeles milk shed and the nonirrigated pasture range conditions of the north coastal region. The function of the major in dairy manufacturing is to train men for positions in the industrial side of dairying.

Men in the dairy husbandry major are provided excellent opportunities to acquire unclear foundation herds through the project program. Foundation herds are available from three dairy breeds. These animals when sold to resident students, are managed under the project herd, and the student shares in the profits in proportion to the production from his animals. Many young men have in the past taken advantage of this opportunity to work into the dairy business with high grade stock.

Facilities

The dairy production unit includes modern and convenient barns for bulls and calves, feeding, sheltering, and milking; and a new judging pavilion. It uses a share of the 2,076-acre school farm and rents an additional 130 acres for pasture and production of feed.

The dairy manufacturing unit includes laboratory facilities for the testing and quality control of various manufactured products. The creamery has been equipped with the most modern equipment for the processing of market milk and the manufacture of butter, cheese, and ice cream. This equipment includes, among other items, a new churn, cheese vat, spray pasteurizer, homogenizer, and continuous ice cream freezer.

The laboratory work in the college creamery is supplemented by field trips to various commercial plants in the area and by the handling and processing of the products of the college dairy farm.

Degree Curricula

Degree programs are offered in this department under dairy husbandry and under dairy manufacturing. At the completion of either of these four-year curricula a student is granted a degree of Bachelor of Science in agriculture with a major in the curriculum he has chosen.

Technical Curricula

Under this department two three-year curricula are offered, one in dairy husbandry and one in dairy manufacturing. These curricula are designed to take care of the individual who finds it necessary to complete his major work in a maximum of three years. These curricula include major work identical to that required under the degree programs but limit the related work to a minimum.

Vocational Curricula

Two-year vocational curricula are offered in both dairy husbandry and dairy manufacturing. A vocational certificate is granted at the completion of either of these curricula. These two-year programs represent the first two years of the technical curricula.

Placement

Degree graduates in dairy husbandry are qualified to fill positions as dairy farm managers or herdsmen or other positions requiring equivalent training. Graduates in dairy husbandry may also qualify as instructors of vocational agriculture, providing they meet the credential requirements.

Degree graduates in dairy manufacturing are qualified for employment leading to supervisory and managerial positions in dairy manufacturing plants processing ice

cream, butter, cheese, evaporated milk, and market milk. They are also qualified for such positions as dairy inspectors and laboratory technicians.

Technical and vocational graduates in dairy husbandry are qualified as assistant herdsmen, assistant farm managers, cow testers, salesmen, and buyers. Technical and vocational graduates in dairy manufacturing are qualified to handle the work of butter making, cheese making, ice cream making, and market milk processing in dairy manufacturing plants.

DEGREE CURRICULUM IN DAIRY HUSBANDRY

	F	W	S
Freshman Year			
English Composition (Eng 104, 105, 106)	3	3	3
Mathematics (Math 102, 103)		2	3
Physical Education (PE 141, 142, 143)	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Project Records (Ec 100)		1	
Health and Hygiene (PE 107)	2		
Zoology (BSc 131, 132)	4	4	
Agricultural Mechanics (AE 121, 122)	2	2	
Anatomy and Physiology (VS 123)			3
Feeds and Feeding (AH 101, 102)	2	2	
Elements of Dairying (DH 121)	4		
Market Milk (DM 132)		4	
Dairy Cattle Judging (DH 123)			3
Forage Crops (CP 123)			4
	17 $\frac{1}{2}$	18 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
Farm Machinery (AE 222, 223)		2	2
Farm Tractors (AE 241)			2
Soils (SS 221)	4		
Public Speaking (Eng 201)		2	
Physical Education (PE 241, 242, 243)	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Bacteriology (BSc 221)	4		
Livestock Hygiene and Sanitation (VS 202)		3	
Animal Parasitology (VS 203)			2
Advanced Dairy Cattle Judging (DH 221)	3		
Milk Production (DH 222)		4	
Dairy Products Judging (DM 233)			3
Dairy Refrigeration (AC 237, 238)	2	2	
Steam Boilers and Equipment (AC 239)			2
General Inorganic Chemistry (PSc 324, 325)	4	4	
Organic Chemistry (PSc 326)			4
Electives			1
	17 $\frac{1}{2}$	17 $\frac{1}{2}$	16 $\frac{1}{2}$
Junior Year			
Principles of Economics (Ec 201, 202)	3	3	
Accounting (Ec 301, 302)	3	3	
* Farm Management (Ec 303)			3
Agricultural Biochemistry (PSc 328)		4	
American Government (Pol Sc 301)	3		
Survey of United States History (Hist 304)		3	
Range and Pasture Management (SS 321)	4		
Dairy Inspection (DM 332)		2	
History of Dairy Breeds and Pedigrees (DH 323)			4
Genetics (BSc 303)			3
Electives	3	2	6
	16	17	16

* Three units of economics selected from the courses listed.

Senior Year			
	F	W	S
* Principles of Marketing (Ec 401)-----	3		
* Cooperative Marketing (Ec 402)-----		3	
Agricultural Prices (Ec 403)-----			3
Animal Breeding (AH 304)-----	3		
Animal Nutrition (AH 402)-----		3	
Family Psychology (Psy 403)-----			3
† Background of Modern Affairs (Hist 305)-----		3	
Dairy Herd Management (DH 321)-----	4		
Undergraduate Thesis (DH 461, 462)-----	2	2	
Undergraduate Seminar (DH 463)-----			2
Electives-----	4	4	8
	<hr/> 16	<hr/> 15	<hr/> 16

TECHNICAL CURRICULUM IN DAIRY HUSBANDRY

Freshman Year			
Technical English (Eng 11, 12, 13)-----	3	3	3
Agricultural Mathematics (Math 15)-----		3	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Project Records (Ec 100)-----		1	
Health and Hygiene (PE 107)-----			2
Animal Biology (BSc 11)-----	3		
Introductory Anatomy and Physiology (VS 12)-----		3	
Agricultural Mechanics (AE 121, 122)-----	2	2	
Feeds and Feeding (AH 101, 102)-----	2	2	
Elements of Dairying (DH 121)-----	4		
Market Milk (DM 132)-----		4	
Dairy Cattle Judging (DH 123)-----			3
Forage Crops (CP 23)-----			4
Electives-----	1		3
	<hr/> 15 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$	<hr/> 15 $\frac{1}{2}$
Sophomore Year			
Farm Machinery (AE 222, 223)-----		2	2
Economic Problems (Ec 41)-----	3		
Farm Bookkeeping (Ec 42, 43)-----		3	3
American Government (Pol Sc 42)-----		3	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Farm Tractors (AE 241)-----			2
Soils (SS 41)-----	4		
Principles of Livestock Hygiene (VS 41)-----	3		
Advanced Dairy Cattle Judging (DH 221)-----	3		
Milk Production (DH 222)-----		4	
Dairy Products Judging (DM 233)-----			3
Refrigeration (AC 237, 238)-----	2	2	
Applied Genetics (BSc 19)-----			3
Steam Boilers and Equipment (AC 239)-----			2
Electives-----		3	2
	<hr/> 15 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Junior Year			
American History (Hist 41)-----	2		
Farm Management (Ec 73)-----			3
Dairy Herd Management (DH 321)-----	4		
Dairy Inspection (DM 332)-----		4	
History of Dairy Breeds and Pedigrees (DH 323)-----			4
Animal Breeding (AH 22)-----		2	
Electives-----	10	11	10
	<hr/> 16	<hr/> 17	<hr/> 17

* Three units of economics selected from among the courses listed.

† State and Local Government (Pol Sc 401) may be substituted.

VOCATIONAL CURRICULUM IN DAIRY HUSBANDRY

The first two years of the Technical Curriculum comprise the two-year vocational curriculum in Dairy Husbandry.

DEGREE CURRICULUM IN DAIRY MANUFACTURING

Freshman Year	F	W	S
English Composition (Eng 104, 105, 106)-----	3	3	3
Agricultural Mathematics (Math 102, 103)-----		2	3
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----	2		
Zoology (BSc 131, 132)-----	4	4	
Anatomy and Physiology (VS 123)-----			3
Feeds and Feeding (AH 101)-----	2		
Elements of Dairying (DH 121)-----	4		
Market Milk (DM 132)-----		4	
Ice Cream Making (DM 133)-----			4
Electives-----	1	3	2
	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>15$\frac{1}{2}$</u>
Sophomore Year			
Public Speaking (Eng 201)-----			2
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Bacteriology (BSc 221)-----	4		
Livestock Hygiene and Sanitation (VS 202)-----		3	
Dairy Bacteriology (BSc 222)-----		3	
Butter Making (DM 231)-----	4		
Cheese Making (DM 232)-----		4	
Dairy Products Judging (DM 233)-----			3
Refrigeration (AC 237, 238)-----	2	2	
Steam Boilers and Equipment (AC 239)-----			2
General Inorganic Chemistry (PSc 324, 325)-----	4	4	
Organic Chemistry (PSc 326)-----			4
Electives-----	3	1	5
	<u>17$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>
Junior Year			
Principles of Economics (Ec 201, 202)-----	3	3	
Accounting (Ec 301, 302)-----	3	3	
American Government (Pol Sc 301)-----	3		
Survey of U. S. History (Hist 304)-----			3
Agricultural Biochemistry (PSc 328)-----		4	
Condensed Milk and Dry Milk Products (DM 331)-----	4		
Dairy Inspection (DM 332)-----		2	
Creamery Records (DM 336)-----			3
Electives-----	4	5	10
	<u>17</u>	<u>17</u>	<u>16</u>
Senior Year			
* Principles of Marketing (Ec 401)-----	3		
* Cooperative Marketing (Ec 402)-----		3	
Agricultural Prices (Ec 403)-----			3
Family Psychology (Psy 403)-----			3
† State and Local Government (Pol Sc 401)-----	3		
Industrial Management (Ec 411)-----		3	
Creamery Management (DM 333)-----			4
Undergraduate Thesis (DM 461, 462)-----	2	2	
Undergraduate Seminar (DM 463)-----			2
Electives-----	9	9	4
	<u>17</u>	<u>17</u>	<u>16</u>

* Three units of economics selected from the courses listed.

† Background of Modern Affairs (Hist 305) may be substituted.

TECHNICAL CURRICULUM IN DAIRY MANUFACTURING

Freshman Year		F	W	S
Technical English (Eng 11, 12, 13) -----		3	3	3
Agricultural Mathematics (Math 15) -----			3	
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----				2
Animal Biology (BSc 11) -----		3		
Feeds and Feeding (AH 101) -----		2		
Elements of Dairying (DH 121) -----		4		
Market Milk (DM 132) -----			4	
Ice Cream Making (DM 133) -----				4
Electives -----		4	6	7
		<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>
Sophomore Year				
Economic Problems (Ec 41) -----		3		
American Government (Pol Sc 42) -----			3	
Physical Education (PE 241, 242, 243) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Principles of Livestock Hygiene (VS 41) -----		3		
Bacteriology (BSc 221) -----		4		
Dairy Bacteriology (BSc 222) -----			3	
Butter Making (DM 231) -----		4		
Cheese Making (DM 232) -----			4	
Dairy Products Judging (DM 233) -----				3
Refrigeration (AC 237, 238) -----		2	2	
Steam Boilers and Equipment (AC 239) -----				2
Electives -----			5	11
		<u>16$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>
Junior Year				
American History (Hist 41) -----		2		
General Accounting (Ec 301, 302) -----		3	3	
Creamery Records (DM 336) -----				3
Condensed Milk & Dry Milk Products (DM 331) -----		4		
Dairy Inspection (DM 332) -----			2	
Creamery Management (DM 333) -----				4
Electives -----		9	12	8
		<u>16</u>	<u>17</u>	<u>17</u>

VOCATIONAL CURRICULUM IN DAIRY MANUFACTURING

The first two years of the Technical Curriculum comprise the two-year vocational curriculum in Dairy Manufacturing.

DESCRIPTIONS OF COURSES IN DAIRY HUSBANDRY**DH 121 Elements of Dairying (4)**

Three one-hour lectures, one three-hour laboratory; fall quarter; freshman year. A general and elementary course in dairying. The importance of the industry from all standpoints, the composition of all the common dairy products, and the common tests that are in use; a study of some of the more commonly used dairy machinery and equipment, and a study of general practices in the feeding and management of a dairy herd.

DH 123 Dairy Cattle Judging (3)

One-hour lecture, two three-hour laboratories; spring quarter; freshman year. Training in the selection of dairy cattle, giving due consideration to breed types while emphasizing the relation of form to function. Comparative judging.

DH 130 General Dairy Husbandry (4)

Three one-hour lectures, one three-hour laboratory; any quarter; senior year. A general study in the selection, feeding, breeding, and management of dairy cattle, also general information on the composition of dairy products and their food value and how to test them for composition. Practical methods for the dairy farmer in producing and handling high quality dairy products will also be studied. This course is planned primarily for students majoring in other agricultural fields.

DH 221 Advanced Dairy Cattle Judging (3)

Two one-hour lectures, one three-hour laboratory; fall quarter; sophomore year. Advanced practice in the comparative judging of dairy cattle. Detailed scoring of cattle on conformation, extensive practice in giving reasons on scoring and comparative placing, combined with visits to sales and leading breeding establishments. Judging team may be selected from this class.

Prerequisite: DH 123.

DH 222 Milk Production (4)

Three one-hour lectures, one three-hour laboratory; winter quarter; sophomore year. A detailed study of the various factors influencing dairy production both within the cow herself such as size, breed, etc., and also those factors involving herd management such as milking, housing, breeding, treatment, etc. Added study of general subjects related to dairy farming.

Prerequisites: DH 121, DH 123, AH 101.

DH 321 Dairy Herd Management (4)

Three one-hour lectures, one three-hour laboratory; fall quarter; junior year. An advanced study in the feeding of dairy cattle both from the standpoint of commercial dairy conditions and official test; fitting animals for sale and show, development of a herd, keeping records, raising dairy stock. A period with a commercial dairy farm is a course requirement.

Prerequisites: DH 121, DH 123, DH 222, AH 101.

DH 323 History of Dairy Breeds and Pedigrees (4)

Two lectures, two laboratories; spring quarter; junior year. Study of origin of modern breeds. Study of breed associations and clubs, registering and transferring cattle. Study of leading families and individuals of breed. Practice in compiling and evaluating pedigrees.

Prerequisites: AH 101, DH 121, DH 222, DH 321.

DH 461, 462 Undergraduate Thesis (2) (2)

Two one-hour meetings; fall and winter quarters; senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

DH 463 Undergraduate Seminar (2)

One two-hour lecture; spring quarter; senior year. The seminar course is designed primarily to assist students in keeping abreast of major developments in their chosen field. In addition to new developments, policies, practices, and procedures will be discussed through regular seminar. Each individual will be responsible for the development and presentation of a topic in his chosen field.

DESCRIPTIONS OF COURSES IN DAIRY MANUFACTURING**DM 130 General Dairy Manufacturing (4)**

Six one-hour lectures, two three-hour laboratories, summer quarter. Especially designed as an elective course for nondairy students and as a survey course for Dairy Husbandry majors. Consists of a nontechnical presentation of the methods and problems involved in modern creamery operation. Laboratories are spent testing, flavoring, and manufacturing butter, various cheeses, ice cream, market milk, and related products.

DM 132 Market Milk (4)

Three one-hour lectures, one three-hour laboratory; winter quarter; freshman year. Classes of market milk. Equipment and methods of producing high quality milk, means of determining quality of market milk, relationship and means of improving it to mutual advantages of producers, processors, distributors, and consumers. Milk plants including their equipment and method of receiving, processing, and marketing the product.

DM 133 Ice Cream Making (4)

Three one-hour lectures and one three-hour laboratory; spring quarter; freshman year. Study of ingredient selection, calculating mixes, and processing techniques for ice cream, ice milk, and sherbets. Freezing principles and methods for both batch and continuous freezers.

DM 231 Butter Making**(4)**

Three one-hour lectures and one three-hour laboratory; fall quarter; sophomore year. Factory butter making, cream separating, neutralizing, pasteurizing, churning, and packing the finished product. Consideration of the various types of pasteurizers and churns used by the industry with emphasis on construction, maintenance, and sanitation. Methods of sampling and grading cream, factory methods of analysis.

Prerequisite: DH 121.

DM 232 Cheese Making**(4)**

Three one-hour lectures and one three-hour laboratory; winter quarter; sophomore year. Commercial manufacture of common varieties of cheese. Selection of quality milk, standardization, starter cultures, manufacturing methods and equipment, and study of the ripening process. Curing room conditions, care and packaging of the finished cheese, methods of analysis.

Prerequisites: DH 121, BSc 221.

DM 233 Dairy Products Judging**(3)**

Two one-hour lectures and one three-hour laboratory; spring quarter; sophomore year. Theory and practice in the score card grading of butter, cheese, ice cream, and market milk.

Prerequisite: DH 121.

DM 331 Condensed Milk and Dry Milk Products**(4)**

Three one-hour lectures and one three-hour laboratory; fall quarter; junior year. Study of the processing and packaging of evaporated and sweetened condensed milk and related products, whole milk powder, and non-fat dry milk solids. Methods and equipment used in the industry, operation of vacuum pans, evaporators, and dryers.

Prerequisites: DH 121, BSc 221, BSc 222.

DM 332 Dairy Inspection**(2)**

One-hour lecture and one three-hour laboratory; winter quarter; junior year. Quality test for milk and cream, practice in the use of score cards for inspection and grading of dairy farms, milk plants and manufacturing plants. Study of the state statutes pertaining to milk and milk products and the duties and responsibilities of city and state inspectors.

Prerequisites: DH 121, DM 132, BSc 221.

DM 333 Creamery Management**(4)**

Three one-hour lectures and one three-hour laboratory; spring quarter; junior year. A course of advanced nature in creamery management, applied accounting, cost analysis of various operations, advertising, marketing, collections, analysis of financial and operating statements.

Prerequisites: DH 121, DM 132, 133, 231, 232, Ec 301, 302.

DM 336 Creamery Records**(3)**

Two one-hour lectures and one three-hour laboratory; spring quarter; junior year. Product control within the plant. Department records, inventories, daily work sheets, load out and route return slips, checking, recapitulation, fat losses and their control and records on receipts, production and distribution as required by the State.

Prerequisite: DM 231, 232, 133, 132.

DM 461, 462 Undergraduate Thesis**(2) (2)**

Two one-hour meetings; fall and winter quarters; senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

DM 463 Undergraduate Seminar**(2)**

Study of current methods of processing dairy products, new equipment, dairy products research.

FIELD, FRUIT, AND TRUCK CROPS DEPARTMENT

Department Head, PAUL DOUGHERTY

STANTON GRAY
JOHN TALBOT

REYNOLD LONBORG
RALPH VORHIES

The function of the Field, Fruit, and Truck Crops Department is to prepare students in the field of crop and fruit growing both as a specialty and as a part of livestock and general farming. The crops department assists with the supervision of the crops and fruits operation on the California State Polytechnic College farm. It grows a variety of plant material for instructional purposes and carries on a limited number of field tests and trials with a view to improving crops operations on the farm.

Three majors are included under this department as indicated in the title. The field crops major trains primarily in cereal and forage crops and other field crops such as beans, sugar beets, peas, etc., and in addition provides related agricultural work for other agricultural major departments. The purpose of the field crops major is to train students in specialized fields and for general farming involving combinations of both crops and livestock.

The deciduous fruit production major prepares students primarily interested in either the growing of deciduous fruits or work in allied fruit industries.

The truck crops curriculum functions primarily to instruct men in economical methods of truck farm operation. Other occupations in truck crops usually include sales work, processing, and the marketing of truck crops.

These majors are designed to furnish the students with a maximum of practical course material, and the college farm furnishes many students with part-time work opportunities and experience in addition to their regular laboratory and field work. Through the cooperation of leading farmers of the surrounding area, diversified farming programs have been used extensively to provide broader experiences. A number of students have been able to maintain growing projects on rented land adjacent to the college farm.

Facilities

The department uses the 400 acres of crop and orchard land and the extensive range and pastures of the California State Polytechnic College farm as a basis for much of its instruction. The equipment and facilities of the farm are all available for the use of students studying crops. Smaller areas are reserved for the study of special crop problems, and land is available near the school farm for projects and farming programs built around class instruction. Plantings of deciduous fruits, walnuts, citrus fruit, avocados, and grapes are available to those taking the general fruit course. The department maintains an extensive collection of seeds, grains, soils, and herbarium specimens for the use of crop students.

California State Polytechnic College orchards include more than 130 varieties of fruits and cover approximately 19 acres. Training facilities and equipment in truck crops make it possible to include instruction in the management of irrigated land, operation of row crop tractors, cultivators, dusting machines and seeding machines, and in the processing and marketing of truck crops.

Degree Curricula

The four-year degree curricula are offered in field crops production, deciduous fruit production, and truck crops production. These curricula, like other agricultural curricula, include a large amount of major work and training in the field selected, and provide the degree student with project opportunities parallel to those of the technical and vocational curricula.

Technical Curricula

In each of the three fields in this department, technical curricula are offered for men who are anxious to complete their training in a shorter period of time than the conventional four years. Technical programs follow closely the degree major requirements but include less required work in the related fields.

Vocational Curricula

Vocational curricula are provided in each of the three majors under this department. Maximum practical training is provided in the majors in the two-year programs.

Placement

The scope of operations of the field, fruit, and truck crop farmers of the State of California make innumerable positions at various levels open to California State Polytechnic College graduates.

Degree graduates are usually placed in responsible positions in fields similar to the majors they have selected. An additional number are interested in going into agriculture teaching, managerial work with feed, seed, and fertilizer production plants, and a number are interested in sales.

Graduates from the technical and vocational curricula are usually placed in positions closely related to the actual production of crops, fruits, or truck crops.

DEGREE CURRICULUM IN FIELD CROPS PRODUCTION

	Freshman Year	F	W	S
English Composition (Eng 104, 105, 106) -----	3	3	3	
Project Records (Ec 100) -----				1
Entomology (BSc 126) -----				4
Botany (BSc 121, 122) -----	4	4		
Mathematics (Math 102, 103) -----		2		3
Agricultural Mechanics (AE 121, 122) -----	2	2		
Farm Surveying (AE 131) -----	2			
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$		$\frac{1}{2}$
Health and Hygiene (PE 107) -----				2
Farm Tractors (AE 241) -----		2		
Field Crops (CP 121) -----	4			
Cereal Crops (CP 122) -----		4		
Forage Crops (CP 123) -----				4
Electives -----	2			
	<hr/>	<hr/>	<hr/>	<hr/>
	17 $\frac{1}{2}$	17 $\frac{1}{2}$		17 $\frac{1}{2}$
	Sophomore Year			
Principles of Economics (Ec 201, 202) -----	3	3		
Public Speaking (Eng 201) -----				2
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$		$\frac{1}{2}$
General Plant Pathology (BSc 223) -----				4
Farm Machinery (AE 221, 222) -----	2			2
Soils (SS 221) -----	4			
Soil Management (SS 222) -----		4		
Weeds and Poisonous Plants (CP 221) -----	4			
General Fruit Production (FP 230) -----		4		
General Truck Crops (TC 230) -----				4
Electives -----	3	5		4
	<hr/>	<hr/>	<hr/>	<hr/>
	16 $\frac{1}{2}$	16 $\frac{1}{2}$		16 $\frac{1}{2}$
	Junior Year			
Accounting (Ec 301, 302) -----	3	3		
* Farm Management (Ec 303) -----				3
General Inorganic Chemistry (PSc 324, 325) -----	4	4		
Organic Chemistry (PSc 326) -----				4
American Government (Pol Sc 301) -----		3		
Survey of U. S. History (Hist 304) -----				3
Irrigation (AE 325, 326) -----		3		3
Crop Pest Control (CP 321) -----		3		
Genetics (BSc 303) -----				3
Commercial Seed Production (CP 331) -----	4			
Electives -----	6	1		
	<hr/>	<hr/>	<hr/>	<hr/>
	17	17		16

* Three units of agricultural economics selected from the courses listed.

Senior Year			
	F	W	S
* Principles of Marketing (Ec 401)-----	3		
* Cooperative Marketing (Ec 402)-----		3	
Agricultural Prices (Ec 403)-----			3
Agricultural Biochemistry (PSc 328)-----		4	
Plant Breeding (CP 304)-----	3		
Family Psychology (Psy 403)-----			3
† Background of Modern Affairs (Hist 305)-----			3
Fertilizers and Fertilizer Practice (SS 322)-----		4	
Oil and Fiber Crops (CP 421)-----	4		
Undergraduate Thesis (CP 461, 462)-----	2	2	
Undergraduate Seminar (CP 463)-----			2
Electives -----	4	3	5
	16	16	16

TECHNICAL CURRICULUM IN FIELD CROPS PRODUCTION

Freshman Year			
Technical English (Eng 11, 12, 13)-----	3	3	3
Project Records (Ec 100)-----			1
Agricultural Mathematics (Math 15)-----		3	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2
Plant Biology (BSc 14)-----	3		
Agricultural Mechanics (AE 121, 122)-----	2	2	
Farm Surveying (AE 131)-----		2	
Farm Tractors (AE 241)-----			2
Field Crops (CP 121)-----	4		
Cereal Crops (CP 122)-----		4	
Forage Crops (CP 23)-----			4
Electives -----	4	2	4
	16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$

Sophomore Year			
Economic Problems (Ec 41)-----	3		
Farm Bookkeeping (Ec 42, 43)-----		3	3
American Government (Pol Sc 42)-----		3	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Soils (SS 41)-----	4		
Farm Machinery (AE 221, 222, 223)-----	2	2	2
Weeds and Poisonous Plants (CP 221)-----	4		
Irrigated Pastures (CP 330)-----		3	
General Truck Crops (TC 230)-----			4
Applied Genetics (BSc 19)-----			3
Electives -----	4	5	4
	17 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$

Junior Year			
American History (Hist 41)-----	2		
Farm Management (Ec 73)-----			3
Irrigation (AE 325, 326)-----		3	3
Crop Pest Control (CP 321)-----		3	
Fertilizers and Fertilizer Practices (SS 72)-----		4	
Commercial Seed Production (CP 331)-----	4		
Plant Breeding (CP 22)-----		3	
Electives -----	10	4	11
	16	17	17

* Three units of agricultural economics selected from the courses listed.

† State and Local Government (Pol Sc 401) may be substituted.

VOCATIONAL CURRICULUM IN CROPS PRODUCTION

The first two years of the Technical Curriculum comprise the two-year Vocational Curriculum in Crops Production.

DEGREE CURRICULUM IN DECIDUOUS FRUIT PRODUCTION

Freshman Year	F	W	S
English Composition (Eng 104, 105, 106) -----	3	3	3
Project Records (Ec 100) -----			1
Mathematics (Math 102, 103) -----		2	3
Agricultural Mechanics (AE 121, 122) -----	2	2	
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----	2		
Entomology (BSc 126) -----			4
Botany (BSc 121, 122) -----	4	4	
Farm Surveying (AE 131) -----	2		
Farm Tractors (AE 241) -----		2	
Pomology (FP 131, 132) -----	4	4	
Nut Crops (FP 133) -----			4
Electives -----			2
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Sophomore Year			
Principles of Economics (Ec 201, 202) -----	3	3	
Farm Machinery (AE 221, 222) -----	2	2	
General Plant Pathology (BSc 223) -----			4
Public Speaking (Eng 201) -----		2	
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Soils (SS 221) -----	4		
Soil Management (SS 222) -----		4	
Deciduous Pest Control (FP 234) -----	4		
Orchard Management (FP 236) -----			4
Fruit Plant Propagation (FP 232) -----		4	
Electives -----	3		7
	<hr/> 16 $\frac{1}{2}$	<hr/> 15 $\frac{1}{2}$	<hr/> 15 $\frac{1}{2}$
Junior Year			
Accounting (Ec 301, 302) -----	3	3	
* Farm Management (Ec 303) -----			3
General Inorganic Chemistry (PSc 324, 325) -----	4	4	
Organic Chemistry (PSc 326) -----			4
American Government (Pol Sc 301) -----	3		
Survey of United States History (Hist 304) -----		3	
Irrigation (AE 325, 326) -----		3	3
Genetics (BSc 303) -----			3
Viticulture (FP 331) -----	4		
Citrus Fruit Production (FP 332) -----		4	
Electives -----	3		4
	<hr/> 17	<hr/> 17	<hr/> 17

* Three units of agricultural economics to be selected from the courses listed.

Senior Year	F	W	S
* Principles of Marketing (Ec 401)-----	3		
* Cooperative Marketing (Ec 402)-----		3	
Agricultural Prices (Ec 403)-----			3
Agricultural Biochemistry (PSc 328)-----		4	
Plant Breeding (CP 304)-----	3		
Family Psychology (Psy 403)-----		3	
† State and Local Government (Pol Sc 401)-----	3		
Fertilizers and Fertilizer Practices (SS 322)-----		4	
Advanced Pomology (FP 421)-----	3		
Undergraduate Thesis (CP 461, 462)-----	2	2	
Undergraduate Seminar (CP 463)-----			2
Electives -----	3		11
	<hr/> 17	<hr/> 16	<hr/> 16

TECHNICAL CURRICULUM IN DECIDUOUS FRUIT PRODUCTION

Freshman Year			
Technical English (Eng 11, 12, 13)-----	3	3	3
Project Records (Ec 100)-----			1
Agricultural Mathematics (Math 15)-----		3	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2
Plant Biology (BSc 14)-----	3		
Agricultural Mechanics (AE 121, 122)-----	2	2	
Farm Surveying (AE 131)-----		2	
Farm Tractors (AE 241)-----			2
Pomology (FP 131, 132)-----	4	4	
Nut Crops (FP 133)-----			4
Electives -----	4	2	4
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Sophomore Year			
Economics Problems (Ec 41)-----	3		
Farm Bookkeeping (Ec 42, 43)-----		3	3
Farm Machinery (AE 221, 222)-----	2	2	
American Government (Pol Sc 42)-----		3	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Soils (SS 41)-----	4		
Deciduous Pest Control (FP 234)-----	4		
Fruit Plant Propagation (FP 232)-----		4	
Orchard Management (FP 236)-----			4
Applied Genetics (BSc 19)-----			3
Electives -----	4	4	6
	<hr/> 17 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Junior Year			
American History (Hist 41)-----	2		
Farm Management (Ec 73)-----			3
Irrigation (AE 325, 326)-----		3	3
Viticulture (FP 331)-----	4		
Fertilizers and Fertilizer Practices (SS 72)-----		4	
Citrus Fruit Production (FP 332)-----		4	
Plant Breeding (CP 22)-----		3	
Electives -----	10	6	11
	<hr/> 16	<hr/> 17	<hr/> 17

* Three units of agricultural economics to be selected from the courses listed.

† Background of Modern Affairs (Hist 305) may be substituted.

VOCATIONAL CURRICULUM IN DECIDUOUS FRUIT PRODUCTION

The first two years of the Technical Curriculum comprise the two-year Vocational Curriculum in Deciduous Fruit Production.

DEGREE CURRICULUM IN TRUCK CROPS PRODUCTION

Freshman Year	F	W	S
English Composition (Eng 104, 105, 106) -----	3	3	3
Project Records (Ec 100) -----			1
Mathematics (Math 102, 103) -----		2	3
Agricultural Mechanics (AE 121, 122) -----	2	2	
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----	2		
Entomology (BSc 126) -----			4
Botany (BSc 121, 122) -----	4	4	
Farm Surveying (AE 131) -----	2		
Farm Tractors (AE 241) -----		2	
Commercial Truck Crops Production (TC 124) -----	4		
Winter Truck Crops Production (TC 125) -----		4	
Warm Season Truck Crops Production (TC 126) -----			4
Electives -----			2
	<u>17$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>
Sophomore Year			
Principles of Economics (Ec 201, 202) -----	3	3	
General Plant Pathology (BSc 223) -----			4
Public Speaking (Eng 201) -----			2
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Farm Machinery (AE 221, 222) -----	2	2	
Soils (SS 221) -----	4		
Soil Management (SS 222) -----		4	
Harvesting and Packaging Truck Crops (TC 224) -----	4		
General Crop Production -----			4
Vegetable Plant Propagation (TC 232) -----		4	
Electives -----	3	3	6
	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>
Junior Year			
Accounting (Ec 301, 302) -----	3	3	
* Farm Management (Ec 303) -----			3
General Inorganic Chemistry (PSc 324, 325) -----	4	4	
Organic Chemistry (PSc 326) -----			4
American Government (Pol Sc 301) -----	3		
Survey of United States History (Hist 304) -----			3
Plant Pathology (BSc 324) -----	3		
Irrigation (AE 325, 326) -----		3	3
Crop Pest Control (CP 321) -----		3	
Truck Crop Marketing (TC325) -----		4	
Genetics (BSc 303) -----			3
Electives -----	3		
	<u>16</u>	<u>17</u>	<u>16</u>

* Three units of agricultural economics to be selected from the courses listed.

Senior Year	F	W	S
* Principles of Marketing (Ec 401) -----	3		
* Cooperative Marketing (Ec 402) -----		3	
Agricultural Prices (Ec 403) -----			3
Agricultural Biochemistry (PSc 328) -----		4	
Plant Breeding (CP 304) -----	3		
Family Psychology (Psy 403) -----			3
† State and Local Government (Pol Sc 401) -----	3		
Fertilizer and Fertilizer Practices (SS 322) -----		4	
Truck Crop Management (TC 424) -----	4		
Undergraduate Thesis (CP 461) -----	2	2	
Undergraduate Seminar (CP 463) -----			2
Electives -----		4	9
	15	17	17

TECHNICAL CURRICULUM IN TRUCK CROPS PRODUCTION

Freshman Year			
Technical English (Eng 11, 12, 13) -----	3	3	3
Project Records (Ec 100) -----			1
Agricultural Mathematics (Math 15) -----		3	
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----			2
Plant Biology (BSc 14) -----	3		
Agricultural Mechanics (AE 121, 122) -----	2	2	
Farm Surveying (AE 131) -----			2
Farm Tractors (AE 241) -----		2	
Commercial Truck Crops Production (TC 124) -----	4		
Winter Truck Crops Production (TC 125) -----		4	
Warm Season Truck Crops Production (TC 126) -----			4
Electives -----	4	2	4
	16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
Economic Problems (Ec 41) -----	3		
Farm Bookkeeping (Ec 42, 43) -----		3	3
American Government (Pol Sci 42) -----		3	
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Farm Machinery (AE 221, 222, 223) -----	2	2	2
Soils (SS 41) -----	4		
Harvesting and Packaging Truck Crops (TC 224) -----	4		
General Fruit Production (FP 230) -----			3
Vegetable Plant Propagation (TC 232) -----		4	
Applied Genetics (BSc 19) -----			3
Electives -----	4	4	5
	17 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$
Junior Year			
American History (Hist 41) -----	2		
Farm Management (Ec 73) -----			3
Irrigation (AE 325, 326) -----		3	3
Crop Pest Control (CP 321) -----		3	
Fertilizers and Fertilizer Practice (SS 72) -----		4	
Truck Crop Marketing (TC 325) -----		4	
Plant Breeding (CP 22) -----		3	
Electives -----	14	1	10
	16	18	16

* Three units of agricultural economics to be selected from the courses listed.
† Background of Modern Affairs (Hist 305) may be substituted.

VOCATIONAL CURRICULUM IN TRUCK CROPS PRODUCTION

The first two years of the Technical Curriculum comprise the two-year Vocational Curriculum in Truck Crops Production.

DESCRIPTIONS OF COURSES IN FIELD CROPS**CP 22 Plant Breeding (3)**

Three one-hour lectures; winter quarter; junior year. Application of the principles of plant improvement through methods of field selection.

CP 23 Forage Crops (4)

Three one-hour lectures and one three-hour laboratory; spring quarter; freshman year. A study of the basic forage crops, including irrigated pasture, alfalfa, the cereal hays, silage crops, and sudan.

CP 121 Field Crops (4)

Three one-hour lectures, one three-hour laboratory; fall quarter; freshman year. Miscellaneous field crops, including field beans, cotton, sugar beets, potatoes, and flax. Soil management, varieties, uses, and harvesting methods are included. Production costs, diseases and pests, and their control are considered.

CP 122 Cereal Crops (4)

Three one-hour lectures, one three-hour laboratory; winter quarter; freshman year. A study of the major cereal crops found in California. Soil management, seed selection, cultivation and irrigation practices, rotation, uses, varieties, harvesting methods, and cost of production are stressed. Common diseases and pests are also considered.

CP 123 Forage Crops (4)

Three one-hour lectures, one three-hour laboratory; spring quarter; freshman year. Typical forage, irrigated pasture, hay and root crops grown in California. Cultural methods and practices are emphasized, while production costs and diseases are also considered. Harvesting, including silage and haymaking, is studied in the field. The effects of these crops in soil improvement and problems of range and pasture maintenance and improvement are stressed.

CP 220 General Field Crops (4)

Three one-hour lectures, one three-hour laboratory; fall quarter; sophomore year. This course is open to all students except field crops majors. The course covers the growing and harvesting of the cereal and field crops of major importance in California. Laboratory includes field operations on the California State Polytechnic College farm and in the San Luis Obispo community.

CP 221 Weeds and Poisonous Plants (4)

Three one-hour lectures, one three-hour laboratory; fall quarter; sophomore year. A study of weeds and weed seeds in field and laboratory, with emphasis on noxious weeds, with the objective of learning to recognize them and to know the conditions under which they usually grow. Problems of weeds in cultivated crops, pastures, hayfields, roadsides, etc. Poisonous plants and their effects on livestock. Laws regarding weeds and weed seeds. Study and practice of present-day weed controls.

Prerequisites: CP 123, BSc 121 or 14

CP 304 Plant Breeding (3)

Three one-hour lectures; fall quarter; junior year. Principles and methods used in improving commercial plants and results secured. Present-day crop improvement through selection, hybridization, back-crossing, and utilization of hybrid vigor. Studies of outstanding type cases of plant breeding in ornamental, fruit, field, and truck crops.

Prerequisites: BSc 122, BSc 303

CP 321 Crop Pest Control (3)

Two lectures, one laboratory; fall quarter; junior year. Methods of combating insect pests, plant diseases, and rodents attacking commercial plants. Sprays, dusts, fumigation and poisoning, as well as cultural and sanitary practices to control pests.

CP 330 Irrigated Pastures**(3)**

Two one-hour lectures and one three-hour laboratory; winter quarter; junior year. An advanced forage crops course with emphasis on culture, management, fertilization, composition, and costs of irrigated pastures. The seeds and plants composing irrigated pastures are studied with reference to identification, adaptation, growth season, and utilization.

Prerequisite: CP 123 or 23

CP 331 Seed Production**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; junior year. A study of California vegetable, flower and field seed industry. Location, methods of growing, harvesting, storing and economic outlook for the principal kinds. Growing disease-free seed for other parts of the country. Certified seed growing and the California Crop Improvement Association. State and federal seed laws as they affect the seed growing industry.

CP 421 Oil and Fiber Crops**(4)**

Three one-hour lectures and one three-hour laboratory; fall quarter; senior year. An advanced course in cotton, flax, and the minor oil crops, including culture, fertilization, harvest, processing, and marketing. Field trips to important centers of crop production.

Prerequisite: CP 122

CP 461, 462 Undergraduate Thesis**(2) (2)**

One two-hour meeting; fall quarter; junior year. The thesis course is designed to assist the student in meeting the thesis requirements under his major. During the fall quarter of the senior year, thesis topics will be reviewed and a topic chosen by each student. Review work on thesis form, methodology, and research will be covered.

One two-hour meeting; fall and winter quarters; senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

CP 463 Undergraduate Seminar**(2)**

One two-hour meeting, spring quarter, senior year. The seminar course is designed primarily to assist students in keeping abreast of major developments in their chosen field. In addition to new developments, policies, practices, and procedures will be discussed through regular seminar. Each individual will be responsible for the development and presentation of a topic in his chosen field.

DESCRIPTION OF COURSES IN DECIDUOUS FRUIT PRODUCTION**FP 123 Beekeeping****(2)**

One-hour lecture, one three-hour laboratory; spring and summer quarters; freshman year. An elementary course covering the problems and possibilities of home and commercial beekeeping in California. Emphasis is placed on developing skill in working with bees and equipment in the preparation and marketing of honey.

FP 131 Pomology**(4)**

Three one-hour lectures, one three-hour laboratory; fall quarter; freshman year. Kinds of deciduous fruits, varieties, production areas, rootstocks, seasonal problems.

FP 132 Pomology**(4)**

Three one-hour lectures, one three-hour laboratory; winter quarter; freshman year. Continuation of FP 131. Establishing an orchard, propagation, pruning, various types of pest control, and cultural practices.

FP 133 Nut Crops**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; freshman year. Problems dealing with the production and marketing of nut crops.

FP 230 General Fruit Production**(4)**

Three one-hour lectures and one three-hour laboratory, any quarter, sophomore year. Designed for students not majoring in fruit production, who want general information about common orchard practices. Pruning, spraying, cover crop growing, grafting, tree-planting, and other seasonal operations.

FP 232 Fruit Plant Propagation**(4)**

Three one-hour lectures, one three-hour laboratory; winter quarter; sophomore year. Propagation by seed, cuttings, layering, grafting, and budding. Special emphasis upon commercial propagation of deciduous orchard stock, including methods of top-working orchards.

Prerequisites: FP 131, 132, 133

FP 234 Deciduous Pest Control**(4)**

Three one-hour lectures, one three-hour laboratory; fall quarter; sophomore year. Advance studies of deciduous fruit pests and diseases, including field identification and application of control materials.

Prerequisite: BSc 126 or BSc 17

FP 236 Orchard Management**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; sophomore year. Problems of fertilization, irrigation, cost of production, pruning, cover crops, labor management, harvesting, and marketing. Evaluating orchards and extended tours made into the field. Problems in the operation of the packing house, dry yard, and dehydration will be studied.

FP 331 Viticulture**(4)**

Three one-hour lectures, one three-hour laboratory; fall quarter; junior year. Problems dealing with the production and marketing of grapes.

FP 332 Citrus Fruit Production**(4)**

Three one-hour lectures, one three-hour laboratory; winter quarter; junior year. Scope of the industry and outlook. Soil and climatic requirements, type, and characteristics of desirable fruit. Frost protection methods. Disease and pest control. Marketing methods and fruit handling for oranges, lemons, and avocados.

FP 421 Advanced Pomology**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, senior year. Marketing, processing, and handling of fruit and fruit products. Field trips to fruit processing centers.

Prerequisite: FP 131, 132, 133

DESCRIPTIONS OF COURSES IN TRUCK CROPS PRODUCTION**TC 124 Commercial Truck Crops Production****(4)**

Three one-hour lectures, one three-hour laboratory; fall quarter; freshman year. A study of major truck crops grown, on a commercial scale, in California. Soil preparation, seed selection, cultivation, irrigation practices, rotation, varieties, and cost of production of crops in the field are considered. Actual practice in the field operations is available as well as observation of commercial practices through field trips.

TC 125 Winter Truck Crop Production**(4)**

Three one hour lectures, one three-hour laboratory; winter quarter; freshman year. A continuation of TC 124. A study of productive practices of winter truck crops. Cauliflower, broccoli, celery, brussels sprouts are some of the crops considered. Field trips into producing districts.

TC 126 Warm Season Truck Crop Production**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; freshman year. A continuation of TC 124 and TC 125. A study of production methods of spring planted truck crops. All tender crops, including lettuce, tomatoes, beans, peas, and carrots are considered. Production methods, harvesting practices, and marketing procedures are included in the instructional material.

TC 224 Harvesting and Packaging Truck Crops

Three one-hour lectures, one three-hour laboratory; fall quarter; sophomore year. Required in degree curriculum in Truck Crops Production. An advanced study of harvesting methods, current packaging techniques, and practices in marketing truck crop products. Market standards and grades from the grower viewpoint are considered. Field trips to packing plants in Santa Maria and Oceano area are included in the course.

TC 230 General Truck Crops**(4)**

Three one-hour lectures, one three-hour laboratory; any quarter; sophomore year. A study of the major truck crops grown in California their culture, harvesting, packing, and marketing. A general study for students other than Truck Crops majors.

TC 232 Vegetable Plant Propagation**(4)**

Three one-hour lectures and one three-hour laboratory, winter quarter, sophomore year. A study of the propagation of various vegetables commonly started by the plant growing method. Cultural practices in open seedbeds and in plant growing structures.

Prerequisites: TC 124, 125, 126, or 230

TC 325 Truck Crops Marketing**(4)**

Three one-hour lectures, one three-hour laboratory; winter quarter; junior year. Required in degree curriculum in Truck Crops Production. An advanced study in the management and operation of commercial truck crops acreage. Course content will include advanced work in production, harvesting, and marketing of truck crops.

TC 424 Truck Crop Management**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, senior year. An advanced study in the management and operation of commercial truck crops acreages. Course work includes advanced work in production, harvesting, marketing operations, and organization.

ORNAMENTAL HORTICULTURE DEPARTMENT

Department Head, WILBUR B. HOWES
HOWARD BROWN

Ornamental horticulture is taught at both San Dimas and San Luis Obispo. Students wishing to take the Bachelor of Science degree may take all four years at San Luis Obispo, or may take the first three years at San Dimas, transferring to San Luis Obispo for the last year. Students wishing to take the technical and vocational courses may enroll at either San Dimas or San Luis Obispo.

The functions of the department are to teach subjects in the field of ornamental horticulture. Courses in nursery work, plant propagation, and glass house management are taught in the school's nursery. Courses in landscape gardening are taught in connection with the planning and maintenance of the campus and grounds. Courses in ornamental plants are taught from the extensive plantings on the college grounds. All major students are expected to carry on a project in the growing of plants. A four-day field trip is scheduled during the spring quarter of each year alternating between the Los Angeles and San Francisco areas. Each student is expected during his course of study to make at least one trip to each area.

Facilities

The facilities of the department include a large propagation house, two lath houses covering approximately 3,000 square feet, a cloth house covering approximately 2,000 square feet, four concrete electrically heated hot beds covering 800 square feet, and approximately 7,000 square feet of glass house space. In addition, there are two new classroom structures. Other equipment includes garden tractors, wheel tractors, and tracklaying tractors; necessary hand garden tools, store houses for fertilizers, and other nursery equipment. A refrigerator for the storage of seeds, bulbs, and plant parts has recently been added. Over 90 acres of the campus are planted with more than 500 species and varieties for student observation. Approximately four acres are devoted to the growing of student projects, lining out of stock, and for the production of annual flowering plants.

Degree Curriculum

The degree curriculum in ornamental horticulture is a four-year program, the completion of which entitles the graduate to the Bachelor of Science degree in agriculture with a major in ornamental horticulture. This curriculum has been designed especially to train individuals in the operation and management of commercial nurseries, glasshouses, and plant propagation industries.

Technical Curriculum

The three-year technical curriculum has been developed to serve men wishing to enter technical positions in actual operation of nurseries, greenhouses, and sales plants. This three-year program under the ornamental horticulture major contains maximum training and experience in the ornamental horticulture field.

Vocational Curriculum

The two-year vocational curriculum was developed especially to qualify men in a limited time as assistants in the industry, or as technicians in the propagation and cultivation of ornamental plants and shrubs. This program is identical to the first two years of the three-year technical curriculum.

Placement

Graduates are prepared for positions in all types of nursery work and for nursery management. They are especially trained for work in glass house management, in plant propagation, and in raising flowers for the cut flower trade. Positions now held by graduates of the department include parks superintendent, nursery salesman, plant propagator, nursery manager, nursery superintendent, and head of a large nursery shipping department. Many of the graduates own their own nurseries. Several others have entered the teaching field. Another field is in civil service, particularly in landscape maintenance, institution gardening, grounds work and flower gardening, and highway and shade tree maintenance.

DEGREE CURRICULUM IN ORNAMENTAL HORTICULTURE

	F	W	S
Freshman Year			
English Composition (Eng 104, 105, 106)-----	3	3	3
Project Records (Ec 100)-----			1
Mathematics (Math 102, 103)-----		2	3
Agricultural Mechanics (AE 121, 122)-----	2	2	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----	2		
Entomology (BSc 126)-----			4
Botany (BSc 121, 122)-----	4	4	
Farm Surveying (AE 131)-----	2		
Nursery Practices (OH 121)-----	4		
Ornamental Shrubbery (OH 122)-----		4	
Plant Propagation (OH 123)-----			4
Electives-----		2	2
	17 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Sophomore Year			
Principles of Economics (Ec 201, 202)-----	3	3	
Farm Tractors (AE 241)-----			2
Public Speaking (Eng 201)-----		2	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
General Plant Pathology (BSc 223)-----			4
Soils (SS 221)-----	4		
Soil Management (SS 222)-----		4	
Ornamental Trees (OH 221)-----	4		
Advanced Plant Propagation (OH 222)-----		4	
Suburban Home Planning (OH 223)-----			4
General Fruit Production (FP 230)-----		4	
Electives-----	4		5
	15 $\frac{1}{2}$	17 $\frac{1}{2}$	15 $\frac{1}{2}$
Junior Year			
Accounting (Ec 301, 302)-----	3	3	
* Farm Management (Ec 303)-----			3
General Inorganic Chemistry (PSc 324, 325)-----	4	4	
Organic Chemistry (PSc 326)-----			4
American Government (Pol Sc 301)-----		3	
Survey of United States History (Hist 304)-----			3
Plant Pathology (BSc 324)-----	3		
Fertilizers and Fertilizer Practice (SS 322)-----		4	
Herbaceous Landscape Plants (OH 321)-----	4		
Greenhouse Design and Management (OH 323)-----			4
Landscape Design (OH 322)-----		4	
Electives-----	3		3
	17	18	17
Senior Year			
* Principles of Marketing (Ec 401)-----	3		
* Cooperative Marketing (Ec 402)-----		3	
Agricultural Prices (Ec 403)-----			3
Agricultural Biochemistry (PSc 328)-----		4	
Genetics (BSc 303)-----			3
Family Psychology (Psy 403)-----			3
† Background of Modern Affairs (Hist 305)-----			3
Citrus Fruit Production (FP 332)-----		4	
Diseases and Pests of Ornamental Plants (OH 327)-----	3		
Undergraduate Thesis (OH 461, 462)-----	2	2	
Undergraduate Seminar (OH 463)-----			2
Electives-----	7	3	2
	15	16	16

* Three units of agricultural economics to be selected from the courses listed.

† State and Local Government (Pol Sc 401) may be substituted.

TECHNICAL CURRICULUM IN ORNAMENTAL HORTICULTURE

Freshman Year		F	W	S
Technical English (Eng 11, 12, 13)-----		3	3	3
Agricultural Mathematics (Math 15)-----			3	
Project Records (Ec 100)-----				1
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$		$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2	
Plant Biology (BSec 14)-----	3			
Agricultural Mechanics (AE 121, 122)-----	2		2	
Farm Surveying (AE 131)-----				2
Nursery Practice (OH 121)-----	4			
Ornamental Shrubbery (OH 122)-----			4	
Plant Propagation (OH 123)-----				4
Electives-----	4		2	6
	16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$	
Sophomore Year				
Economic Problems (Ec 41)-----	3			
Farm Bookkeeping (Ec 42, 43)-----			3	3
American Government (Pol Sc 42)-----			3	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$		$\frac{1}{2}$	$\frac{1}{2}$
Farm Tractors (AE 241)-----				2
Soils (SS 41)-----	4			
Soil Management (SS 42)-----			4	
Ornamental Trees (OH 221)-----	4			
Advanced Plant Propagation (OH 222)-----			4	
Suburban Home Planning (OH 223)-----				4
Electives-----	6		2	7
	17 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$	
Junior Year				
American History (Hist 41)-----	2			
Farm Management (Ec 73)-----				3
Herbaceous Landscape Plants (OH 321)-----	4			
Greenhouse Design and Management (OH 323)-----				4
Landscape Design (OH 322)-----			4	
Fertilizer and Fertilizer Practices (SS 72)-----			4	
Diseases and Pests of Ornamental Plants (OH 327)-----	3			
Electives-----	7		9	10
	16	17	17	

VOCATIONAL CURRICULUM IN ORNAMENTAL HORTICULTURE

The first two years of the Technical Curriculum comprise the two-year Vocational Curriculum in Ornamental Horticulture.

DESCRIPTIONS OF COURSES IN ORNAMENTAL HORTICULTURE**OH 121 Nursery Practices (4)**

Three one-hour lectures, one three-hour laboratory; fall quarter; freshman year. Production of bedding plants, pot plants, trees and shrubs. Special emphasis on sowing, potting, canning, fertilizing, irrigation, and pest control.

OH 122 Ornamental Shrubbery (4)

Three one-hour lectures and one three-hour laboratory, winter quarter, freshman year. The identification and study of broadleaf shrubs, both evergreen and deciduous, used in landscaping.

OH 123 Plant Propagation (4)

Three one-hour lectures, one three-hour laboratory; spring quarter; freshman year. Principles of sexual and asexual propagation. Gathering, storing, and planting of seeds. Making of cuttings, fall budding, and layering.

OH 220 Farm Home Planning**(3)**

Two one-hour lectures and one three-hour laboratory, any quarter, any year. For non-horticultural majors. To make a study of the layout for the rural home and farm yards and buildings. A study of the correct placing of roadways, drives, walks, trees, shrubs, and lawns.

OH 221 Ornamental Trees**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, sophomore year. The identification and study of broadleaf ornamental trees used in landscaping. A study of both evergreen and deciduous trees is carried on.

OH 222 Advanced Plant Propagation**(4)**

Three one-hour lectures, one three-hour laboratory; winter quarter; sophomore year. Special emphasis upon grafting; dormant budding, lining out, balling out, and the making of hardwood cuttings.

Prerequisites: OH 122, OH 123

OH 223 Suburban Home Planning**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; sophomore year. The planning and elementary principles of design connected with the landscaping of the small city home. The student is expected to plan the landscaping of an actual small city home.

OH 230 General Nursery Practices**(3)**

Two one-hour lectures and one three-hour laboratory, spring quarter, any year. For non-horticulture majors. A general course in horticulture with emphasis on nursery work. The course will include budding, potting, seed sowing, transplanting, insect and disease control, preparation of lawns, planting of trees and shrubs, and the maintenance of flower beds.

OH 321 Herbaceous Plants**(4)**

Three one-hour lectures, one three-hour laboratory; fall quarter, junior year. The identification, use and propagation of herbaceous plant material in landscaping.

Prerequisite: OH 122, 221, 223

OH 322 Landscape Design**(4)**

Three one-hour lectures, one three-hour laboratory; winter quarter; junior year. Principles of design as applied to city and country property with special emphasis on the design of small city and country parks.

Prerequisites: OH 122, OH 221, OH 223

OH 323 Greenhouse Design and Management**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; junior year. The study of problems involved in the construction, maintenance, and management of forcing structures. A study of the management and production of commercial flower crops.

Prerequisites: OH 121, OH 122, OH 123, OH 221, OH 222

OH 327 Diseases and Pests of Ornamental Plants**(3)**

Two one-hour lectures, one three-hour laboratory; fall quarter; junior year. This is a detailed study of diseases and pests of ornamental plants, their effect on plants and their prevention and control.

Prerequisites: OH 122, BSc 223

OH 461, 462 Undergraduate Thesis**(2) (2)**

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

OH 463 Undergraduate Seminar**(2)**

Two one-hour meetings, spring quarter, senior year. A round-table discussion of all the topics related to plant science.

POULTRY DEPARTMENTDepartment Head, **RICHARD I. LEACH*** **BERNIE BAILEY****LEO SANKOFF**

The purpose of the poultry program is to give young men training and experience in the skills needed to operate successfully a poultry ranch, hatchery, service organization, or marketing establishment. The projects and laboratory skills are supplemented with courses in poultry husbandry to give the student the necessary fundamental knowledge and information to reason and work out all problems likely to confront him in commercial endeavor. Courses such as Poultry Feeding supplement the student's experience with basic information on preparing economical feeds and on the nutritional deficiencies and effects of various feeds on the product produced.

California ranks as the fourth leading state in the Country in poultry production. This state is considered outstanding in commercial egg production. The income from poultry and poultry products exceeds 150 million dollars per year.

Each student majoring in poultry husbandry completes a minimum requirement in project activities, under supervision, for graduation in any of the curricula. The California State Polytechnic College poultry plant is designed and operated almost entirely by the students as a part of their project program. The plant does a large sales business in eggs, chicks, dressed poultry, and other products.

The project program gives the students practice in all phases of operation found under commercial conditions in California. The projects are mostly student owned, or the student shares in the profits derived from the operation. The student earns while he is acquiring skills from project or commercial activities.

Facilities

The college plant has facilities for 4,000 laying and breeding hens in projects, and broods about 12,000 chicks each season.

The flock consists of the trapnest, pedigree Leghorn breeders, also a breeding flock of New Hampshires, Barred Rocks, and Dark Cornish. Each year the students raise in projects several thousand fryers, as well as turkeys, both of the small Beltsville White and Broad-Breast varieties.

A large variety of buildings, methods of ventilation, kinds of yard and types of equipment is found in the college project plant, which gives the student an opportunity to become familiar with nearly all types of facilities on California poultry farms. The students have an opportunity to gain experience with battery brooders, floor-gas brooders, floor electric brooders, as well as sunshine brooders. Several common commercial makes, as well as student-made types, are available.

The project plant facilities also include a hatchery with 12,000 egg capacity. Students receive practice in operating the hatchery, in pedigree hatching, and in working with the flock improvement program.

In addition to the producing units, there is a new modern poultry dressing plant with a picking machine and automatic scalding tank. This plant is designed with overhead tracks for efficient handling of birds, as well as several drawing tables and cooling tanks. Adjacent to a large walk-in refrigerator, is a special room for grading and wrapping dressed birds.

The egg-handling building and salesroom is equipped with counters and candling benches sufficient for a laboratory class. The building is equipped with an egg-cleaning machine, an automatic egg grader, humidifier cooler, and attractive salesroom. The students each have an opportunity to learn proper methods of grading and processing eggs and poultry meat in this modern plant.

Degree Curriculum

The four-year degree curriculum leading to the Bachelor of Science degree with a major in poultry husbandry was designed primarily to qualify individuals for managerial positions in the poultry fields. In addition to the regular poultry production courses, management and development courses are included, along with a full program of related work common to all agriculture majors.

* On military leave.

Technical Curriculum

The three-year technical curriculum in poultry husbandry was set up primarily to meet the needs of the individual interested in going directly into poultry production. Men anticipating ownership of commercial poultry concerns are encouraged to complete, as a minimum, the three-year technical curriculum.

Vocational Curriculum

The two-year vocational curriculum in poultry husbandry was set up primarily to qualify individuals for a limited number of positions in poultry husbandry in minimum time. The vocational curriculum includes the first two years work of the technical curriculum in poultry husbandry.

Placement

A large number of the graduates in poultry husbandry return to their home poultry plants or start in business for themselves after graduation. Each year a greater number of requests are received for graduates as sales and service men for feed and supply companies. Other requests are for technically trained men to take over or develop a branch in a hatchery, or to do pedigree work for breeders, or to operate commercial ranches on a partnership basis. Each year there are several positions open for turkey flock managers or broodermen. In an industry of this size, there are always positions open in marketing and distributing poultry products. The technically trained poultryman has the fundamental knowledge and skills necessary to make rapid progress, and he progresses rapidly in foreman and superintendent positions.

Students completing the degree curriculum will find many positions open for laboratory assistants, teachers, marketing specialists, poultry improvement program inspectors, market product inspectors, as well as commercial poultry producers.

DEGREE CURRICULUM IN POULTRY HUSBANDRY

	Freshman Year	F	W	S
English Composition (Eng 104, 105, 106) -----		3	3	3
Project Records (Ec 100) -----		1		
Mathematics (Math 102, 103) -----			2	3
Agricultural Mechanics (AE 121, 122) -----		2	2	
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----		2		
Zoology (BSc 131, 132) -----			4	4
Feeds and Feeding (AH 101) -----		2		
Poultry Industry and Breeds (Poul 121) -----		4		
Poultry Brooding (Poul 122) -----			4	
Poultry Feeding (Poul 123) -----				4
Electives -----		2	2	2
		<u>16$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>
	Sophomore Year			
Principles of Economics (Ec 201, 202) -----		3	3	
Farm Tractors (AE 241) -----				2
Soils (SS 221) -----		4		
Public Speaking (Eng 201) -----			2	
Physical Education (PE 241, 242, 243) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Bacteriology (BSc 221) -----		4		
Livestock Hygiene and Sanitation (VS 202) -----			3	
Poultry Selecting and Culling (Poul 221) -----		2		
Poultry Pathology and Diseases (Poul 231) -----		2		
Poultry Products (Poul 222) -----			3	
Poultry Incubation (Poul 223) -----				2
Poultry Housing (Poul 233) -----				2
Genetics (BSc 303) -----				3
Electives -----		2	5	7
		<u>17$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>

Junior Year			
	F	W	S
Accounting (Ec 301, 302)-----	3	3	
* Farm Management (Ec 303)-----			3
General Inorganic Chemistry (PSc 324, 325)-----	4	4	
Organic Chemistry (PSc 326)-----			4
American Government (Pol Sc 301)-----	3		
Survey of United States History (Hist 304)-----		3	
Farm Structures and Carpentry (AE 321, 322)-----	2	2	
Poultry Breeding (Poul 321)-----	4		
Poultry Anatomy and Diseases (Poul 322)-----		4	
Hatchery Management (Poul 303)-----			4
Electives-----			5
	16	16	16
Senior Year			
* Principles of Marketing (Ec 401)-----	3		
* Cooperative Marketing (Ec 402)-----		3	
Agricultural Prices (Ec 403)-----			3
Agricultural Biochemistry (PSc 328)-----		4	
Family Psychology (Psy 403)-----			3
† Background of Modern Affairs (Hist 305)-----	3		
Advanced Poultry Plant Management (Poul 402)-----		3	
Undergraduate Thesis (Poul 461, 462)-----	2	2	
Undergraduate Seminar (Poul 463)-----			2
Electives-----	9	5	9
	17	17	17

TECHNICAL CURRICULUM IN POULTRY HUSBANDRY

Freshman Year			
	F	W	S
Agricultural Mechanics (AE 121, 122)-----	2	2	
Project Records (Ec 100)-----	1		
Technical English (Eng 11, 12, 13)-----	3	3	3
Agricultural Mathematics (Math 15)-----		3	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2
Animal Biology (BSc 11)-----	3		
Feeds and Feeding (AH 101)-----	2		
Poultry Industry and Breeds (Poul 121)-----	4		
Poultry Brooding (Poul 122)-----		4	
Poultry Feeding (Poul 123)-----			4
Electives-----	2	4	7
	17 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
Economic Problems (Ec 41)-----	3		
Farm Bookkeeping (Ec 42, 43)-----		3	3
American Government (Pol Sc 42)-----		3	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Farm Tractors (AE 241)-----			2
Soils (SS 41)-----	4		
Principles of Livestock Hygiene (VS 21)-----	3		
Poultry Selecting and Culling (Poul 221)-----	2		
Poultry Pathology and Diseases (Poul 231)-----	2		
Poultry Products (Poul 222)-----		3	
Poultry Incubation (Poul 223)-----			2
Poultry Housing (Poul 233)-----			2
Applied Genetics (BSc 19)-----			3
Electives-----	2	7	4
	16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$

* Three units of economics selected from the courses listed.

† State and Local Government (Pol Sc 401) may be substituted.

	Junior Year		
	F	W	S
American History (Hist 41)-----	2		
Farm Management (Ec 73)-----			3
Farm Structures and Carpentry (AE 321, 322)-----	2	2	
Poultry Breeding (Poul 321)-----	4		
Poultry Anatomy and Diseases (Poul 322)-----		4	
Poultry Plant Management (Poul 306)-----			3
Electives -----	8	11	11
	<hr/> 16	<hr/> 17	<hr/> 17

VOCATIONAL CURRICULUM IN POULTRY HUSBANDRY

The first two years of the Technical Curriculum comprises the Vocational Curriculum in Poultry Husbandry.

DESCRIPTIONS OF COURSES IN POULTRY HUSBANDRY

Poul 121 Poultry Industry and Breeds (4)

Three one-hour lectures, one three-hour laboratory; fall quarter; freshman year. A general study of the scope and place of the poultry industry as it applies to agriculture. A study of poultry organizations and publications as well as opportunities in the industry. A study of poultry breeds and their selection for commercial purposes. Judging for utility and exhibition type.

Poul 122 Poultry Brooding (4)

Three one-hour lectures, one three-hour laboratory; winter quarter; freshman year. A study of and planning for the replacement program on the California poultry ranch. A study of brooding equipment, brooding principles and practices, growth and development of the chick, care and feeding of growing stock. Diagnosis, prevention, and control of chick diseases and vices.

Poul 123 Poultry Feeding (4)

Three one-hour lectures, one three-hour laboratory; spring quarter; freshman year. A study of poultry feeds and feeding principles; and their effects on the birds. Technique of feeding birds economically for egg production, growth and fattening. Nutritional diseases and deficiencies are discussed. The manufacturing of feeds and constructing of formulae for specific purposes. The fundamentals of metabolism and digestion of the fowl.

Prerequisite: AH 101

Poul 221 Poultry Selecting and Culling (2)

One hour lecture, one three-hour laboratory; fall quarter; sophomore year. Biological and environmental factors that affect the number, size, and quality of eggs produced. A study of the causes of culls and culling practices in the commercial poultry plants. Practices and skill in grading and culling.

Poul 222 Poultry Products (3)

Two one-hour lectures, one three-hour laboratory; winter quarter; sophomore year. A study of prices and trends in California for eggs, broilers, roasters, and turkeys. A study of packaging, grading, storing, and selling of poultry products. Market grades standards and laws. Practice in drawing, cutting up, and grading poultry, also grading and candling eggs.

Poul 223 Poultry Incubation (2)

One hour lecture, one three-hour laboratory; spring quarter; sophomore year. Fundamental study of embryology and metabolism of the developing embryo. Principles and practices in artificial incubation, and environmental, nutritional, and breeding factors affecting the hatch. Selection, care, and operation of commercial incubators. Selection and care of hatching eggs.

Poul 230 General Poultry Production**(4)**

Three one-hour lectures, one three-hour laboratory; spring or summer quarter; any year. For students not majoring in poultry husbandry. A general course including problems of selecting stock, brooding, feeding, culling, and judging. The student is given a basic understanding of poultry housing and equipment for the general farm. Some work is given in marketing poultry and grading and candling eggs. A general survey of the importance of poultry to California agriculture is presented with the fundamentals of poultry as a related enterprise.

Poul 231 Poultry Pathology and Diseases**(2)**

One hour lecture, one three-hour laboratory; fall quarter; sophomore year. A study of changes to the bird and economic importance of some of the common poultry parasites and diseases. A study is made of the causes of disease and pathologic changes due to disease attacks. Practice is given in autopsy and disease diagnosis.

Poul 233 Poultry Housing**(2)**

One hour lecture, one three-hour laboratory, spring quarter, sophomore year. Planning and organizing the buildings and equipment arrangement of the poultry plant. Balancing the brooding, growing, and laying house facilities for efficient operation of the ranch. A study of types and principles of poultry housing. Principles of ventilation, construction, and design. Construction, organization, and types of equipment to meet commercial needs.

Prerequisite: Poul 122

Poul 248 Hatchery Practice**(1)**

One three-hour laboratory, winter or spring quarter, sophomore year. A laboratory course in commercial hatchery operation. Includes care and operation of incubators, sanitation in the hatchery, grading and sorting chicks, wing banding and pedigreeing chicks, and hatchery records.

Prerequisite: Sophomore standing in poultry husbandry

Poul 303 Hatchery Management**(4)**

Four one-hour lectures, spring quarter; junior year. This is a thesis type of course in the organization and layout for the operation of a breeder or multiplier hatchery. Each student works on an individual problem of outlining the complete program for a hatchery. Emphasis is placed on the breeding program and inter-relationship of the hatchery and cooperating egg-producing flocks. An advertising program of billboards, circulars, catalogs, and other aids in publicity are considered. The arrangement of equipment, services and facilities of the hatchery for maximum efficiency are studied. Both financial and production record keeping systems are studied.

Prerequisite: Poul 321

Poul 306 Poultry Plant Management**(3)**

Three one-hour lectures, spring quarter; junior year. A review and coordination of various problems pertaining to an economic and efficient management of a poultry plant. A discussion on feeding, brooding, disease control, breeding and marketing.

Prerequisites: All freshmen and sophomore poultry courses and Poul 321

Poul 321 Poultry Breeding**(4)**

Three one-hour lectures, one three-hour laboratory; fall quarter; junior year. Fundamental factors of genetics as applied to problems of poultry breeding. A study of hereditary factors as they apply to developing a strain of birds for commercial egg production. A study of sib-testing, progeny testing, experimental mating, and pedigree. A study and practice in pedigree and flock mating for commercial purposes. Laboratory practice in operation and analysis of pedigree breeding records of the college project flock.

Prerequisite: Poul 221

Poul 322 Poultry Anatomy and Diseases**(4)**

Three one-hour lectures, one three-hour laboratory, winter quarter; junior year. A study of the causes, pathology, prevention and control of poultry diseases of economic importance in California. A study of life cycles and control of poultry parasites. Sanitation practices on the farm. Special emphasis is placed on reproductive, circulatory, respiratory, and digestive organs and their functions. Laboratory practice in autopsy, disease diagnosis, and study of the anatomy of the fowl.

Prerequisites: Poul 231, BSc 11 or BSc 131

Poul 402 Advanced Poultry Plant Management**(3)**

Three one-hour lectures, winter quarter, senior year. A study of the general organization and coordination of the commercial poultry plant. The student is expected to outline and plan the operation of a poultry plant including budgets, record keeping systems, accounts, replacement program, marketing, and health of a flock. This course requires supervised commercial practice or equivalent.

Prerequisites: All freshman and sophomore poultry courses and Poul 321

Poul 431 Turkey Production**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, senior year. A study is made of commercial turkey production in California. Brooding, rearing, and marketing of turkeys under commercial conditions. Turkey varieties, breeding, and judging. Feeding, housing, proper equipment, and control of turkey diseases are studied. The student is expected to outline a plan for organization and operation of a commercial sized turkey producing plant.

Prerequisites: Poul 123, Poul 231, Poul 321

Poul 461, 462 Undergraduate Thesis**(2) (2)**

One two-hour lecture, fall and winter quarters, senior year. This includes the outline, reference reading and research necessary for the planning and complete preparation of a thesis in approved form. The subject must be chosen and the material prepared by conference with the department head and other members of the staff. The problem developed in the thesis is related to the student's major interest in some subject of poultry husbandry.

Poul 463 Undergraduate Seminar**(2)**

One two-hour lecture, spring quarter, senior year. The seminar program is designed to give the student experience in preparing and presenting in an organized manner subject matter on some problem related to poultry husbandry. The seminar also includes a review of current research, experiments, and problems related to the field of the student's major interest.

SOIL SCIENCE DEPARTMENT

Department Head, LOGAN S. CARTER

LAWRENCE ALBAN

ARNOLD M. DEAN

The function of the Soil Science Department is twofold: first, to provide training for men in the Agricultural Division enrolled in other graduation majors; and, second, to prepare students in the occupational fields of soils, conservation, range management, and farm operation. Courses in Soil Science have been developed with lecture, laboratory, and field coverage to provide fundamental knowledge of the subject and its application in agricultural production.

Facilities: The facilities of the department are being expanded to provide sufficient laboratory and field house space and equipment to meet the needs of the program. Demonstration plots and the application of practices on the college farm are utilized to the fullest possible extent in the study of methods for putting soil knowledge to work. Work of outstanding value on nearby ranches and that being carried on by public agencies is also utilized to a large extent as a supplement to the on-campus instruction.

Degree Curriculum: The degree curriculum in soil science is a four-year program, the completion of which entitles the graduate to the Bachelor of Science degree in agriculture with a major in soil science. The curriculum has been designed to train individuals for employment in two major categories; namely, positions that require a wide knowledge of agriculture, such as vocational agricultural teachers, conservationists, or farm operators; and, secondly, highly specialized work, such as that of soil surveys and laboratory technicians.

Technical Curriculum: The three-year technical curriculum has been developed to serve men who have a limited amount of time for college instruction but wish a broad knowledge of agriculture with special work in soil science. This program offers the maximum in the application aspects of soil science.

Vocational Curriculum: The two-year vocational curriculum was developed as a short-term study of the major work in soil science, with emphasis on the application of practices in agricultural production.

Placement: Graduates are prepared for positions with county, state, and federal agencies as specialists in soils, conservation, and range management. They are also trained to be better farm operators or employees of commercial concerns specializing in fertilizers or agricultural chemicals. Graduates may also enter the teaching field, with additional preparation in social science.

DEGREE CURRICULUM IN SOIL SCIENCE

Freshman Year	F	W	S
English Composition (Eng 104, 105, 106) -----	3	3	3
Agricultural Mathematics (Math 102, 103) -----		2	3
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----	2		
Agricultural Mechanics (AE 121, 122) -----	2	2	
Botany (BSc 121, 122) -----	4	4	
General Animal Husbandry (AH 130) -----		4	
General Dairy Husbandry (DH 130) -----	4		
General Poultry Production (Poul 230) -----			4
Forage Crops (CP 123) -----			4
Farm Surveying (AE 131, 132) -----		2	2
	<u>15½</u>	<u>17½</u>	<u>16½</u>

Agricultural Division

121

	F	W	S
Sophomore Year			
Principles of Economics (Ec 201, 202)-----	3	3	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Public Speaking (Eng 201)-----		2	
General Inorganic Chemistry (PSc 324, 325)-----	4	4	
Organic Chemistry (PSc 326)-----			4
Bacteriology (BSc 221)-----	4		
Soils (SS 221)-----	4		
Soil Management (SS 222)-----		4	
Soil Technology (SS 223)-----			4
Farm Tractors (AE 241)-----			2
General Fruit Production (FP 230)-----		4	
General Truck Crops (TC 230)-----			4
Electives -----			4
	<hr/> 15 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$
Junior Year			
American Government (Pol Sc 301)-----	3		
Survey of United States History (Hist 304)-----			3
Accounting (Ec 301, 302)-----	3	3	
Agricultural Biochemistry (PSc 328)-----		4	
Range and Pasture Management (SS 321)-----	4		
Fertilizers and Fertilizer Practices (SS 322)-----		4	
Soil and Water Conservation (SS 323)-----			4
Irrigation (AE 325, 326)-----		3	3
* Farm Management (Ec 303)-----			3
Agricultural Prices (Ec 403)-----			3
* Agricultural Resources (Ec 305)-----		3	
Electives -----	8		2
	<hr/> 18	<hr/> 17	<hr/> 18
Senior Year			
* Principles of Marketing (Ec 401)-----	3		
* Cooperative Marketing (Ec 402)-----		3	
Family Psychology (Psy 403)-----			3
† Background of Modern Affairs (Hist 305)-----	3		
Soil Classification (SS 421)-----	3		
Soil Microbiology (SS 422)-----		3	
Soil Physics (SS 423)-----			3
Soil Chemistry (SS 433)-----			3
Undergraduate Thesis (SS 461, 462)-----	2	2	
Undergraduate Seminar (SS 463)-----			2
Electives -----	5	8	3
	<hr/> 16	<hr/> 16	<hr/> 14

* Three units of economics selected from the courses listed.

† State and Local Government (Pol Sc 401) may be substituted.

TECHNICAL CURRICULUM IN SOIL SCIENCE

Freshman Year	F	W	S
Technical English (Eng 11, 12, 13)-----	3	3	3
Agricultural Mathematics (Math 15)-----		3	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2
Plant Biology (BSc 14)-----	3		
Agricultural Mechanics (AE 121, 122)-----		2	2
General Animal Husbandry (AH 130)-----		4	
General Poultry Production (Poul 130)-----			4
Soils (SS 41)-----	4		
Soil Management (SS 42)-----		4	
Soil Technology (SS 43)-----			4
General Dairy Husbandry (DH 130)-----	4		
Farm Surveying (AE 131)-----		2	
Electives-----	2		
	<u>16$\frac{1}{2}$</u>	<u>18$\frac{1}{2}$</u>	<u>15$\frac{1}{2}$</u>
Sophomore Year			
Economic Problems (Ec 41)-----	3		
Farm Bookkeeping (Ec 42, 43)-----		3	3
American Government (Pol Sc 42)-----		3	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Public Speaking (Eng 201)-----		2	
Farm Tractors (AE 241)-----			2
General Fruit Production (FP 230)-----		4	
General Truck Crops (TC 230)-----			4
Range and Pasture Management (SS 71)-----	4		
General Field Crops (CP 220)-----	4		
Fertilizers and Fertilizer Practices (SS 72)-----		4	
Chemistry in Agriculture (PSc 74)-----	3		
Electives-----	3		6
	<u>17$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>15$\frac{1}{2}$</u>
Junior Year			
Farm Management (Ec 73)-----			3
American History (Hist 41)-----	2		
Irrigation (AE 325, 326)-----		3	3
Soil Classification (SS 421)-----	3		
Soil and Water Conservation (SS 73)-----			4
Electives-----	11	14	7
	<u>16</u>	<u>17</u>	<u>17</u>

VOCATIONAL CURRICULUM IN SOIL SCIENCE

The first two years of the Technical Curriculum comprise the two-year Vocational Curriculum in Soil Science.

DESCRIPTIONS OF COURSES IN SOIL SCIENCE**SS 41 Soils****(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, freshman or sophomore year. An introductory course dealing with the physical, chemical, and biological properties of soils. Special attention is given to the effect of tillage, manuring, irrigation, drainage, and fertilizer practices on the productivity of California soils.

SS 42 Soil Management**(4)**

Three one-hour lectures and one three-hour laboratory, winter quarter, freshman or sophomore year. Occurrence, composition, productivity, comparative values, and management of different soil types. Effect of various crops and farming systems on fertility gains and losses of soil, evaluation of soils, and practices for California agriculture.

Prerequisite: SS 41

SS 43 Soil Technology**(4)**

Three one-hour lectures and one three-hour laboratory, spring quarter, sophomore year. A course designed for students majoring in soil science. Consideration is given to physical and chemical properties of soil in relation to the technical problems of using and managing soils. Special emphasis is placed on the adaptation of practices to California soils, climatic crop conditions.

Prerequisites: SS 41, 42

SS 71 Range and Pasture Management**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, sophomore or junior year. Management of range and pasture land resources involving an inventory of soil, vegetation, and ranch facilities of selected ranches, evaluation of grazing problems and practices, and the development of specific plans for effective production and utilization of range and pasture forage.

Prerequisites: SS 41, BSc 14, CP 123

SS 72 Fertilizers and Fertilizer Practices**(4)**

Three one-hour lectures and one three-hour laboratory, winter quarter, sophomore or junior year. Plant nutrient requirements of crops, effect of soil and climatic conditions on the availability of plant nutrients in the soil, composition and value of fertilizers and soil amendments, current practices and new developments in the application of fertilizers and soil amendments in California.

Prerequisite: SS 41

SS 73 Soil and Water Conservation**(4)**

Three one-hour lectures and one three-hour laboratory, spring quarter, sophomore or junior year. Evaluation of climate, topography, soils and land use on soil and water losses from crop, grazing, and wood lands. Review of current plans and practices for erosion control and water conservation, and the development of plans for conservation efforts on selected farms.

Prerequisite: SS 41

SS 221 Soils**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, sophomore year. Origin, formation, composition, classification, and the physical, chemical, and biological properties of soils; effect of texture, structure, organic matter content, reaction, and profile development on soil productivity; and the evaluation of tillage, manuring, drainage, irrigation, and fertilizer practices for California soils.

SS 222 Soil Management**(4)**

Three one-hour lectures and one three-hour laboratory, winter quarter, sophomore year. Occurrence, composition, productivity, plant nutrient availability, comparative values, and management of different soil types. Effect of various crops and farming systems on fertility gains and losses of soils, evaluation of soils and practices for California agriculture.

Prerequisite: SS 221

SS 223 Soil Technology**(4)**

Three one-hour lectures and one three-hour laboratory, spring quarter, sophomore year. A course designed for students majoring in soil science. Consideration is given to the physical and chemical properties of soils in relation to technical problems of using and managing soils. Special emphasis is placed on the adaptation of practices to California soils, climatic, and crop conditions.

Prerequisites: SS 221, 222

SS 321 Range and Pasture Management**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, junior year. Application of range management principles to the utilization of range and pasture land resources, study of forage production potentialities of native and introduced range and pasture plants and lands suitable for such use, evaluation of methods for the establishment or improvement of range and pasture forage, survey of ranch and other facilities and grazing problems, and the development of plans for effective production and utilization of range and pasture forage.

Prerequisites: SS 221, BSc 121, 122, CP 123

SS 322 Fertilizers and Fertilizer Practices**(4)**

Three one-hour lectures and one three-hour laboratory, winter quarter, junior year. Plant nutrient requirements of crops, effect of soil and climatic conditions on the availability of nutrients in the soil, analysis of soils and crops relative to the need for fertilizers, study of deficiency symptoms of plants, composition and value of fertilizers and soil amendments, and current methods employed in the application of fertilizers.

Prerequisites: SS 221, PSc 324

SS 323 Soil and Water Conservation**(4)**

Three one-hour lectures and one three-hour laboratory, spring quarter, junior year. A course of study dealing with climate, topography, soils and land use in relation to soil and water losses from crop, grazing, and wood lands; soil and erosion classification and mapping, and the development of land capability classes; evaluation of soil and water conservation programs and practices, and the preparation of plans for conservation efforts on selected farms.

Prerequisites: SS 221, AE 131, 132

SS 421 Soil Classification and Mapping**(3)**

Two one-hour lectures and one three-hour laboratory, fall quarter, offered alternate years. A course designed to give those students interested in professional work in soil science, a working knowledge of the techniques employed in the classification of land and soils. Involves a study of systems used in the classification of soils and land capabilities; mapping of assigned areas and the preparation of standard type survey reports.

Prerequisites: SS 221, 222, 223; SS 321, 322, 323

SS 422 Soil Microbiology**(3)**

Two one-hour lectures and one three-hour laboratory, winter quarter, offered alternate years. Types, numbers, relationship, and biochemical activities of soil organisms; effect of soil organisms on formation, characteristics, and productivity of soils; importance of organisms in manuring, fertilizing, drainage, and irrigation practices; and the methods of studying soil organisms.

Prerequisites: SS 221, 222, 223; SS 321, 322, 323; BSc 221

SS 423 Soil Physics**(3)**

Two one-hour lectures and one three-hour laboratory, spring quarter, offered in alternate years. A study of texture, structure, colloids, absorption, solubility, forms of moisture, temperature, and the physical chemical reactions of soils, methods of analysis for ionic reactions, conductometric titration, oxidation, reduction reactions of soils, application of physical-chemical soil relationships to farming practices.

Prerequisites: SS 221, 222, 223; SS 321, 322, 323

SS 433 Soil Chemistry**(3)**

Two one-hour lectures and one three-hour laboratory, spring quarter, offered in alternate years. Course deals with the fundamental concepts and practices of soil chemistry, methods of soil diagnosis and treatment, and the interpretation of significant investigations for the management of soils.

Prerequisites: SS 221, 222, 223; SS 321, 322, 323

SS 461, 462 Undergraduate Thesis**(2) (2)**

One two-hour meeting, fall and winter quarters, senior year. This includes the outline, reference reading, and research necessary for the planning and complete preparation of a thesis in approved form. The subject must be chosen and the material prepared by conference with the department head and other members of the staff. The problem developed in the thesis is related to the student's major interest in some subject of Soil Science.

SS 463 Undergraduate Seminar**(2)**

One two-hour meeting, spring quarter, senior year. The seminar program is designed to give the student experience in preparing and presenting in an organized manner subject matter on some problem related to soil science. The seminar also includes a review of current research, experiments, and problems related to the field of the student's major interest.

VETERINARY SCIENCE

ROSCOE K. BALCH

Veterinary Science courses are offered to supplement the major work provided in the animal science departments of the agricultural division. Keeping college herds and flocks healthy provides opportunities for laboratory classes in courses offered. In addition to serving functions as required courses, veterinary science courses are open as elective courses.

DESCRIPTIONS OF COURSES IN VETERINARY SCIENCE**VS 12 Introductory Anatomy and Physiology (3)**

Two one-hour lectures and one three-hour laboratory, winter quarter, freshman year. Introduction to the anatomy and physiology of farm animals.

Prerequisite: BSc 11

VS 41 Principles of Livestock Hygiene (3)

Three one-hour lectures, fall quarter, sophomore year. Introduction to livestock health problems resulting from infectious diseases, parasites, and malnutrition.

VS 123 Anatomy and Physiology (3)

Two one-hour lectures and one three-hour laboratory, spring quarter, freshman year. Introduction to anatomy and the related physiological functions of farm animals.

Prerequisites: BSc 131, 132

VS 202 Livestock Hygiene and Sanitation (3)

Three one-hour lectures, winter quarter, sophomore year. Study of animal health problems as encountered on the farm. The livestock producer's part in disease control and animal health improvement programs.

Prerequisite: BSc 221

VS 203 Animal Parasitology (2)

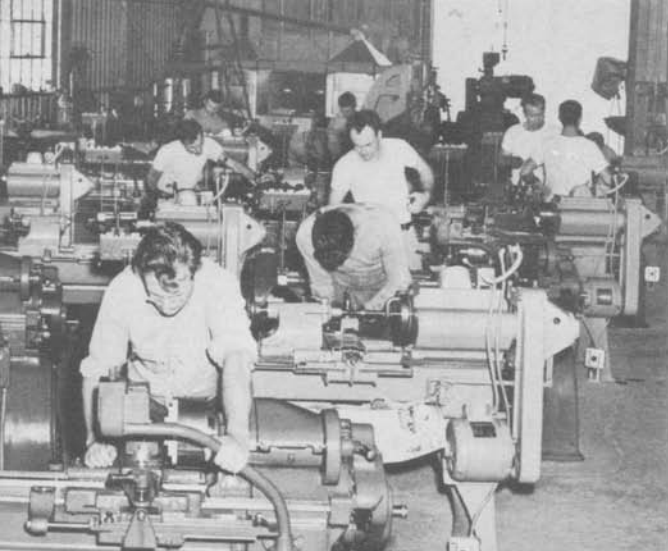
Two one-hour lectures, spring quarter, sophomore year. A study of the external and internal parasites causing economic loss in livestock—life cycles and control of parasites.

Prerequisites: BSc 131, 132

ENGINEERING DIVISION



Top: Students in aeronautical engineering study all types of airplane engines, from early models to the latest jets. In addition to the large shops for construction and engine overhaul, there is a hangar on the college's flying strip. **Bottom:** Cal Poly's "School for Country Printers" trains men to enter the printing industry from this fully-equipped shop where they learn to operate all the machines of the trade.



Left: Students in the variety of engineering courses of the college receive instruction in the modern, well-lighted machine shop. Bottom: An instructor in architectural engineering goes over a blueprint with students. Center: Air conditioning students inspect Freon equipment for a quick freeze box.



THE ENGINEERING AND INDUSTRIAL DIVISION

The various curricula in the engineering and industrial division are outlined and the courses described on the following pages. Each curriculum in the division follows a common pattern of related courses and a similar pattern of requirements within the major.

THE DEGREE CURRICULA IN ENGINEERING

Degree curricula are provided in the following engineering fields: Architectural Engineering, Aeronautical Maintenance and Operations Engineering, Air Conditioning and Refrigeration Engineering, Electrical Engineering, Electronic and Radio Engineering, Mechanical Engineering, Maintenance Engineering, and Printing.

Admission into the degree curricula in all engineering majors except Printing demands that, in addition to meeting the general college requirements for entrance, a student show proficiency in both mathematics and physics. His record on the placement examinations in these two subjects must be high enough to allow him to enroll in college physics and in college algebra as a freshman, before entrance into any of the engineering degree curricula. Students intending to register in this division will find it to their advantage to include in their high school courses one year of algebra, one year of geometry, and a half-year of trigonometry. High school physics and chemistry are also desirable.

If the results of placement examinations indicate that the student is lacking in prerequisites to engineering, it will be necessary for him to pursue one of the two following programs, unless he chooses to enroll in Printing:

1. He may choose to spend one year in college in an engineering preparatory course that will include mathematics and physics and other related subjects but no major work, or,
2. He may choose to enroll in a technical curriculum.

TECHNICAL CURRICULA

In the engineering division, three-year technical curricula are offered in all of the majors. These technical curricula have been developed to serve the individual who is less interested in the more theoretical engineering work and to provide for those who must prepare themselves for skilled positions in the industrial fields in a comparatively short time.

Technical courses in major work, although often carrying the same title as courses under the degree curricula, are taught separately and from an approach which stresses the most practical application possible.

TWO-YEAR TECHNICAL CURRICULA

In a number of the industrial fields, vocational certificates are provided individuals who successfully complete the first two years of the technical program. These certificates have been developed because students completing two years of work in a number of majors in the engineering and industrial division are qualified to handle assignments in industrial fields.

The two-year curricula meet the needs of men who must train themselves in a rather short time for specific places in industry. It is possible for an individual to have completed the two-year technical program and continue one more year to secure the technical certificate which is granted at the end of the third year. Students who have completed the three-year technical program, however, may not secure a Bachelor of Science degree by merely going one year beyond the three-year technical course. Men with degree aspirations must complete all related and major work under degree curricula listed as required. Technical courses in the major field and in the related fields will not substitute for degree courses in these same fields.

AERONAUTICAL ENGINEERING DEPARTMENT

Department Head, LESTER W. GUSTAFSON

RICHARD E. HALL
M. C. MARTINSENROY F. METZ
ROBERT A. NEEDHAM

ALDEN L. TURNER

The objective of the Aeronautical Department at the California State Polytechnic College is to train students either for positions in the aircraft maintenance and operations field, or for engineering positions in the aircraft industry or the various government agencies. The Aeronautical Department operates an approved mechanics school and repair station under the rating of the United States Department of Commerce, Civil Aeronautics Administration.

Facilities

The aircraft laboratory work is performed in the college's modern hangar which has 12,000 square feet of floor space. The hangar is equipped with the necessary wood- and metalworking tools and machinery, as well as many test units required for the checking and trouble shooting of aircraft. There are also facilities for the sewing and preparation of fabric for the covering of aircraft, and for painting and dope spraying.

The engine section includes a building having a floor area of approximately 7,000 square feet, which houses the facilities for the disassembly, repair, overhaul, test, and assembly of modern aircraft and their components.

The engineering section has a drafting room equipped with the types of tools and reference manuals found in modern drafting offices. The engineering laboratories are equipped with instruments, testing equipment and tools typical of those used in the aircraft industry.

Degree Curriculum

The four-year degree curriculum which leads to the Bachelor of Science degree is designed to train students in either the field of aeronautical engineering or the maintenance and operations phase of the aircraft industry. Successful completion of the course qualifies the student to enter the field of aircraft engineering or maintenance and operations engineering, depending on his choice of electives. With the proper selection of electives the maintenance and operations engineering student can qualify at the end of the winter quarter of the senior year to take his C. A. A. examination for the airplane and the airplane engine mechanics certificate.

Technical Curriculum

This three-year technical curriculum is designed to prepare the student for positions in aircraft construction and repair, engine repair and maintenance, as well as supervisory positions in these fields of occupations. The technical curriculum includes the required shop and lecture courses to qualify the student to take his C. A. A. examination for the airplane and the airplane engine mechanics certificate.

Two-year Technical Curriculum

A vocational certificate will be awarded to the student who successfully completes the first two years of the technical curriculum.

Placement

The aeronautical engineering curriculum prepares the student for a position in the engineering department of the aircraft manufacturing industry, the operations and maintenance department of the airlines, or the various government agencies and laboratories.

DEGREE CURRICULUM IN AERONAUTICAL ENGINEERING

Freshman Year			
	F	W	S
Physics (PSc 131, 132, 133) -----	4	4	4
Algebra (Math 107, 108) -----	3	3	
Analytic Geometry (Math 109) -----			3
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----			2
Engineering Drafting (ME 121, 122, 123) -----	2	2	2
Machine Shop (ME 141, 142, 143) -----	1	1	1
Welding Shop (ME 151, 152, 153) -----	1	1	1
Aircraft Power Plant Fundamentals (Aero 121) -----	3		
Aircraft Engine Operation Principles (Aero 122) -----		3	
Aircraft Engine Construction Practices (Aero 123) -----			3
Basic Aircraft Woodwork (Aero 131) -----	3		
Aircraft Woodwork (Aero 132) -----		3	
Aircraft Covering and Finishing (Aero 133) -----			3
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 19 $\frac{1}{2}$
Sophomore Year			
English (Eng. 104, 105, 106) -----	3	3	3
Calculus (Math 201, 202, 203) -----	3	3	3
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Aeronautical Drafting Laboratory (Aero 244, 245, 246) -----	1	1	1
Aircraft Materials and Processes (Aero 211) -----	2		
Aircraft Hydraulic Systems (Aero 212) -----		2	
Aircraft Electrical Systems Theory (Aero 213) -----			2
Public Speaking (Eng 201) -----		2	
* Electives -----	8	7	8
	<hr/> 17 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Junior Year			
General Chemistry (PSc 321, 322, 323) -----	4	4	4
American Government (Pol Sc 301) -----	3		
Survey U. S. History (Hist 304) -----			3
Industrial Economics (Ec 313) -----			3
Elementary Aerodynamics (Aero 304, 305, 306) -----	3	3	3
Aircraft Strength of Materials (Aero 307, 308, 309) -----	2	2	2
Aircraft Strength of Materials Lab (Aero 329) -----			2
† Background Modern Affairs (Hist 305) -----		3	
* Electives -----	6	6	
	<hr/> 18	<hr/> 18	<hr/> 17
Senior Year			
Industrial Management (Ec 411) -----		3	
Industrial Relations (Ec 412) -----			3
Family Psychology (Psy 403) -----	3		
Undergraduate Thesis (Aero 461, 462) -----	2	2	
Undergraduate Seminar (Aero 463) -----			2
* Electives -----	12	12	12
	<hr/> 17	<hr/> 17	<hr/> 17

* By the proper selection of 48 units of electives in aeronautics, with the approval of the adviser, the student may qualify for graduation in either the Engineering or the Maintenance and Operation Option.

† State and Local Government (Pol Sc 401) may be substituted.

**THREE-YEAR TECHNICAL CURRICULUM IN AERONAUTICAL
OPERATIONS AND MAINTENANCE**

Freshman Year	F	W	S
Physics (PSc 11, 12, 13)-----	3	3	3
Mathematics (Math 11, 12, 13)-----	3	3	3
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2
Engineering Drafting (ME 121, 122, 123)-----	2	2	2
Machine Shop (ME 141, 142, 143)-----	1	1	1
Welding Shop (ME 151, 152, 153)-----	1	1	1
Aircraft Power Plant Fundamentals (Aero 11)-----	3		
Aircraft Engine Operation Principles (Aero 12)-----		3	
Aircraft Engine Construction Practices (Aero 13)-----			3
Basic Aircraft Woodwork (Aero 21)-----	3		
Aircraft Woodwork (Aero 22)-----		3	
Aircraft Covering and Finishing (Aero 23)-----			3
Electives -----	1	1	
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$
Sophomore Year			
English (Eng. 11, 12, 13)-----	3	3	3
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
American Government (Pol Sc 42)-----		3	
Machine Shop (ME 241, 242, 243)-----	1	1	1
Welding Shop (ME 251, 252, 253)-----	1	1	1
Aero Drafting Lab (Aero 61, 62, 63)-----	1	1	1
Aircraft Engine Electrical Systems (Aero 41)-----	4		
Aircraft Engine Carburetion and Fuel Systems (Aero 42)-----		4	
Aircraft Propellers (Aero 43)-----			4
Aircraft Materials and Processes (Aero 51)-----	4		
Aircraft Hydraulic and Control Systems (Aero 52)-----		4	
Aircraft Electrical Systems (Aero 53)-----			3
Aircraft Inspection Practices and Procedures (Aero 59)-----			1
Analytic Mechanics (ME 44)-----	3		
Elective -----			3
	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Junior Year			
Aircraft Strength of Materials (Aero 91, 92, 93)-----	2	2	2
Aircraft Strength of Materials Lab. (Aero 96)-----			2
Aircraft Engine Repair Procedure (Aero 71)-----	4		
Aircraft Engine Lubrication (Aero 72)-----		4	
Aircraft Maintenance (Aero 81)-----	4		
Aircraft Repair Procedures (Aero 82)-----		4	
Aircraft Overhaul and Repair Procedures (Aero 84, 85, 86)-----	2	1	1
Aircraft Repair Procedures (Aero 83)-----			2
Aircraft Engine Overhaul Procedure (Aero 73)-----			2
Aircraft Engine Installation and Removal (Aero 74, 75, 76)-----	2	2	1
Civil Air Regulations (Aero 78)-----			1
Technical Aerodynamics (Aero 97, 98, 99)-----	3	3	3
American History (Hist 41)-----	2		
Electives -----		1	3
	<hr/> 19	<hr/> 17	<hr/> 17

**TWO-YEAR TECHNICAL CURRICULUM IN AERONAUTICAL
OPERATIONS AND MAINTENANCE**

The two-year technical curriculum consists of the first two years of the three-year technical curriculum.

DESCRIPTIONS OF COURSES IN AERONAUTICAL ENGINEERING**Aero 121 Aircraft Powerplant Fundamentals (3)**

Two one-hour lectures and one three-hour laboratory, fall quarter, freshman year. History and development of aircraft engines as to types, cylinder arrangements, cooling systems, and principles and nomenclature of engine components dealing with materials of construction and design.

Study and making sketches of parts of a complete aircraft engine, the relationship of one part to the other, the correct disassembly and assembly procedures, and the use, care, and application of the proper tools.

Aero 122 Aircraft Engine Operation Principles (3)

Two one-hour lectures and one three-hour laboratory, winter quarter, freshman year. Fundamentals of engine operation, such as the two and four stroke cycle principle, piston displacement, volumetric efficiency, compression ratio, horsepower calculations, analysis of the Otto cycle, power overlap, valve overlap, crankshaft rotation, cam speeds and rotation, derivation of firing order, and valve actuating mechanism. Disassembly of an aircraft engine, cleaning and inspection of parts for defects, use of micrometers and special measuring tools to determine amount of wear and tear permitted by manufacturers' specifications.

Prerequisite: Aero 121

Aero 123 Aircraft Engine Construction Practice (3)

Two one-hour lectures and one three-hour laboratory, spring quarter, freshman year. Engine design and construction practices dealing with material specifications, surface finishes, vibration control, cooling systems, engine sections, induction systems, superchargers, Civil Air Regulations pertaining to the replacement of parts, airworthiness and proof of conformity as applied to overhaul, inspection, and maintenance of certificated aircraft engines. Engine assembly, valve adjustment, and magneto timing. Lubrication systems.

Prerequisite: Aero 122

Aero 131 Basic Aircraft Woodwork (3)

Two one-hour lectures and one three-hour shop period, fall quarter, freshman year. Selection, care, and use of hand and power woodworking tools applicable to construction and repair of aircraft; fundamentals and specifications for selection of woods and glues and their use in aircraft; procedure for layout and construction of a wood wing rib; applicable CAA regulations.

Practical layout of an airfoil section (wing rib), development of a rib jig, and construction of wing ribs to prescribed specifications.

Aero 132 Aircraft Woodwork (3)

Two one-hour lectures and one three-hour shop period, winter quarter, freshman year. Nomenclature for aircraft; procedures and CAA regulations governing repairs of wood wing ribs and spars and plywood covering; the internal rigging of airplane structures; inspection and preparation of a structure for covering.

Shaping, rigging, finishing, repairing, and covering of spars and wing panels.

Prerequisite: Aero 131

Aero 133 Aircraft Covering and Finishing (3)

Two one-hour lectures and one three-hour shop period, spring quarter, freshman year. CAA specifications for selection and use of textile and finishing materials. Materials and techniques of repairs for damaged fabric.

Prerequisite: Aero 132

Aero 211 Aircraft Materials and Processes (2)

Two one-hour lectures, fall quarter, sophomore year. Metal materials in aircraft construction and processes employed in shaping, finishing, and joining during fabrication and assembly. Applicable CAA regulations.

Aero 212 Aircraft Hydraulic Systems**(2)**

Two one-hour lectures, winter quarter, sophomore year. Operating functions, adjustments, and trouble shooting of different types of hydraulic systems. Hydraulic plumbing, fluids, fluid seals, landing gear shock struts, and appropriate CAA regulations.

Aero 213 Aircraft Electrical Systems Theory**(2)**

Two one-hour lectures, spring quarter, sophomore year. Laws of electricity as applied to aircraft electrical units and systems. Electrical system load analysis, circuit protection methods, and components such as conduit, conductors, voltage regulators, motors, inverters. Applicable CAA regulations.

Aero 221 Aircraft Engine Electrical Systems**(4)**

Two one-hour lectures and two three-hour laboratories, fall quarter, sophomore year. Principles of electricity and batteries as applied to magnetos, battery ignition, starter systems and control units, spark plugs, ignition harness, and auxiliary starting methods. Nomenclature, construction, operation, repair, installation and timing procedures, common failures, their cause and remedy. Disassembly, inspection, assembly, tests, and repair procedure for electrical circuits in active aircraft.

Prerequisite: Aero 123

Aero 222 Aircraft Engine Carburetion and Fuel Systems**(4)**

Two one-hour lectures and two three-hour laboratories, winter quarter, sophomore year. Fuels, fuel systems, induction systems, and superchargers. Theory and principles of float and pressure carburetors, types, nomenclature, common troubles, and methods of correction. Applicable CAA regulations.

Disassembly, inspection, assembly, and adjustment of float type carburetors, diaphragm and injection carburetors, and fuel injectors as applied to small engines. Repair procedures for fuel pumps on opposed and radial engines.

Prerequisite: Aero 123

Aero 223 Aircraft Propellers**(4)**

Two one-hour lectures and two three-hour laboratories, spring quarter, sophomore year. Propeller theory and principles of operation of fixed pitch, constant speed, hydromatic, and electric propellers. Repair procedures for propellers and applicable CAA regulations.

Aero 231 Engineering Problems**(2)**

One one-hour lecture and one three-hour computation period, fall quarter, sophomore year. Introduction to graphical and analytical solutions of engineering problems, with emphasis on neatness and arrangement of computations.

Prerequisite: Math 107

Aero 232 Engineering Problems**(2)**

One one-hour lecture and one three-hour computation period, winter quarter, sophomore year. Slide rule computations, development of empirical equations and alignment charts, and methods of mechanical integration.

Prerequisite: Math 109, Aero 231

Aero 233 Engineering Problems**(2)**

One one-hour lecture and one three-hour laboratory, spring quarter, sophomore year. Applications of the level and transit to aeronautical problems. Airplane weight and balance computations.

Prerequisite: Aero 232

Aero 240 Additional Engineering Laboratory**(1-2)**

One or two three-hour laboratories, any quarter, sophomore year. Total credit limited to four units, with not more than two units in any one quarter.

Aero 244 Aero Drafting Laboratory**(1)**

One three-hour laboratory, fall quarter, sophomore year. Drafting machines and drafting technique, with emphasis on neatness, arrangement, and lettering.

Prerequisite: ME 121

Aero 245 Aero Drafting Laboratory (1)

One three-hour laboratory, winter quarter, sophomore year. Practical problems in elementary descriptive geometry as applied to aircraft.

Prerequisite: Aero 244

Aero 246 Aero Drafting Laboratory (1)

One three-hour laboratory, spring quarter, sophomore year. AN standards, manufacturers' drafting room manuals, and CAA requirements, as applied to aircraft design, maintenance, repair, and overhaul.

Prerequisite: Aero 245

Aero 251 Aircraft Metal Fabrication (2)

Two three-hour laboratories, fall quarter, sophomore year. Riveting, hand and machine forming, aluminum alloys, bending sheet metal with the Leaf and Vertical brakes, operating and caring for general hand and power tools, splicing and swaging aircraft cables.

To be taken concurrently with Aero 211.

Aero 252 Aircraft Control Systems (2)

Two three-hour laboratories, winter quarter, sophomore year. Inspection, repair, overhaul, operation, and adjustment of aircraft hydraulic components and systems, landing gear assemblies and brakes, primary and secondary flight control systems.

To be taken concurrently with Aero 212

Aero 253 Aircraft Electrical Systems Laboratory (1)

One three-hour laboratory, spring quarter, sophomore year. Practice in battery testing and charging methods, checking voltage regulator operation, tracing, checking, trouble-shooting, and repairing the electrical systems of various aircraft.

To be taken concurrently with Aero 213

Aero 256 Aircraft Inspection and Line Service (1)

One three-hour laboratory, spring quarter, sophomore year. Typical daily, pre-flight, and periodic inspections; introduction to weight and balance of aircraft; general line service; familiarization with pertinent CAA forms.

Prerequisites: Aero 133, 211, 212, 213, 251, 252, 253

Aero 304 Elementary Aerodynamics (3)

Three one-hour lectures, fall quarter, junior year. Properties of the atmosphere, air flow, drag and lift forces, properties of airfoils, power required and power available.

Prerequisite: Math 108

Aero 305 Elementary Aerodynamics (3)

Three one-hour lectures, winter quarter, junior year. Applications of the principles of aerodynamics to the various performance items of aircraft.

Prerequisite: Aero 304

Aero 306 Elementary Aerodynamics (3)

Three one-hour lectures, spring quarter, junior year. Aircraft propeller theory and application to flight performance; cruise control determination, parasite drag estimation, and special performance problems.

Prerequisite: Aero 305

Aero 307 Aircraft Strength of Materials (2)

Two one-hour lectures, fall quarter, junior year. Strength of materials as applied to aircraft structures, with emphasis on analytical methods of calculating the strength of tension members, riveted joints, bolted joints, and pressure vessels.

Prerequisite: ME 201, Math 202

Aero 308 Aircraft Strength of Materials (2)

Two one-hour lectures, winter quarter, junior year. Methods of calculating the strength and deflections of simple beams. Problems in the strength of round structural elements in torsion.

Prerequisite: Aero 307

Aero 309 Aircraft Strength of Materials

(2)

One one-hour lecture and one three-hour computation period, spring quarter, junior year. Simple column analysis and graphical and analytical solutions of statically determinate trusses.

Prerequisite: Aero 308

Aero 314 Aircraft Hydraulic Theory

(3)

Three one-hour lectures, fall quarter, junior year. Application of fluid flow principles to the components of aircraft. Compressible and incompressible fluids.

Prerequisite: Math 201

Aero 321 Aircraft Engine Repair Procedure

(4)

Two one-hour lectures and two three-hour laboratories, fall quarter, junior year. Disassembly, inspection, and repair procedure for the engine as outlined in manufacturers' manuals.

Prerequisites: Aero 123, 221, 222

Aero 322 Aircraft Engine Lubrication

(4)

Two one-hour lectures and two three-hour laboratories, winter quarter, junior year. Theory of lubricating oils and lubricating systems, types of oiling systems, CAA regulations applicable to the installation, securing, maintenance, and repair of oiling systems.

Prerequisite: Aero 321

Aero 329 Aircraft Strength of Materials Laboratory

(2)

One one-hour lecture and one three-hour laboratory, spring quarter, junior year. Tension, compression, bending, and torsion tests of aircraft materials.

Prerequisite: Aero 308

Aero 331 Aircraft Maintenance

(4)

Two one-hour lectures and two three-hour laboratories, fall quarter, junior year. Aircraft disassembly, inspection, reassembly, checking, and rigging preparatory to test flight; problems in aircraft weight and balance; applicable CAA regulations and safety practices.

Prerequisites: Aero 133, 251, 252, 253, 256

Aero 332 Aircraft Repair Procedures

(4)

Two one-hour lectures and two three-hour laboratories, winter quarter, junior year. Inspection methods and procedures, cost estimating of repairs, maintenance and overhaul, safety practices, materials and processes, and applicable CAA regulations.

Prerequisite: Aero 331

Aero 335 Advanced Theory of Aircraft Engines

(3)

Two one-hour lectures and one three-hour laboratory, winter quarter, junior year. Thermodynamics of combustion processes, thermal efficiencies, fuels. Testing and analyzing of engine performance data.

Prerequisite: Math 202

Aero 336 Advanced Theory of Aircraft Engines

(3)

Two one-hour lectures and one three-hour laboratory, spring quarter, junior year. Study of the various factors affecting the performance of aircraft engines. Determination of performance characteristics of the aircraft engines by standard methods.

Prerequisite: Aero 335

Aero 343 Aircraft Engine Overhaul Procedure

(2)

Two three-hour laboratories, spring quarter, junior year. Inspection, repair, overhaul, and assembly of aircraft engines, with special emphasis on the general repair and replacement of parts. Use of the manufacturers' table of limits as a guide in operations involving the fits, clearances, pressures, and application of torque values to be employed.

Prerequisite: Aero 322

Aero 353 Aircraft Repair Procedures**(2)**

Two three-hour laboratories, spring quarter, junior year. Use and care of hand and machine tools peculiar to the maintenance, repair, and overhaul of aircraft. Building of fabrication fixtures and jigs.

Prerequisite: Aero 332

Aero 400 Special Problems for Advanced Undergraduates**(1-2)**

One or two three-hour laboratories, any quarter, senior year. Total credit limited to four units, with not more than two units in any one quarter.

Aero 401 Aircraft Stress Analysis**(3)**

Three one-hour lectures, fall quarter, senior year. Problems in restrained and continuous beams, torsion of noncircular sections, and combined stress calculations.

Prerequisite: Aero 309, Math 203

Aero 402 Aircraft Stress Analysis**(3)**

Three one-hour lectures, winter quarter, senior year. Stress analysis of sheet-stringer combinations in compression and shear.

Prerequisite: Aero 401

Aero 403 Aircraft Stress Analysis**(3)**

Three one-hour lectures, spring quarter, senior year. Analysis of statically indeterminate frames and rings by the method of least work. Development of flight and landing loads.

Prerequisite: Aero 402

Aero 405 Civil Air Regulations**(1)**

One one-hour lecture, winter quarter, senior year. Review of all CAA regulations applicable to maintenance, repair, overhaul, and recertification of civil aircraft. Aero 405 and Aero 455 qualify the student to take the CAA examinations for an aircraft mechanic's certificate.

Prerequisite: Aero 431

Aero 411 Aerodynamics**(2)**

Two one-hour lectures, fall quarter, senior year. Dimensional analysis, Reynolds and Mach number effects, wing theory and wind tunnel testing methods.

Prerequisite: Aero 306

Aero 412 Aerodynamics**(2)**

Two one-hour lectures, winter quarter, senior year. Control surface characteristics, static and dynamic stability.

Prerequisite: Aero 411

Aero 413 Aerodynamics**(2)**

Two one-hour lectures, spring quarter, senior year. An introduction to the aerodynamics of transonic and supersonic flight.

Prerequisite: Aero 412

Aero 421 Aircraft Engine Installation and Removal**(3)**

One one-hour lecture and two three-hour laboratories, fall quarter, senior year. Design ideas and construction of engine mounts; cooling systems and cowlings; induction and exhaust systems, and materials of construction; types of controls; installation of tubing used in the oil and fuel systems; electrical cables and connections; applicable CAA regulations.

Aero 422 Aircraft Engine Testing and Trouble Shooting**(2)**

One one-hour lecture and one three-hour laboratory, winter quarter, senior year. Run in and test procedures as outlined by the engine manufacturers; malfunctioning of units and procedure for their correction.

Prerequisite: Aero 421

Aero 431 Aircraft Overhaul, Maintenance, and Repair

(3)

One one-hour lecture and two three-hour laboratories, fall quarter, senior year. Review of aircraft servicing, maintenance, repair, and overhaul practices and procedures preparatory to the CAA examinations.

Prerequisite: Aero 333

Aero 441 Aircraft Structures Laboratory

(1)

One three-hour laboratory, fall quarter, senior year. Laboratory experiments in combined stress conditions and investigation of non-circular sections in torsion.

Prerequisite: Aero 309, 359

Aero 442 Aircraft Structures Laboratory

(1)

One three-hour laboratory, winter quarter, senior year. Laboratory experiments in elastic stability of thin sheet metal structural elements particular to semi-monocoque aircraft structures.

Prerequisite: Aero 441

Aero 443 Aircraft Structures Laboratory

(1)

One three-hour laboratory, spring quarter, senior year. Special problems in testing components of aircraft structures.

Prerequisite: Aero 442

Aero 444 Aircraft Detail Design

(2)

Two three-hour laboratory periods, fall quarter, senior year. Design, layout, and detail drawing of approved CAA repairs for aircraft.

Prerequisite: Aero 246

Aero 445 Aircraft Detail Design

(2)

Two three-hour laboratory periods, winter quarter, senior year. Design of modifications of aircraft.

Prerequisite: Aero 444

Aero 446 Aircraft Detail Design

(2)

Two three-hour laboratory periods, spring quarter, senior year. Design of special equipment used for aircraft maintenance and operations.

Prerequisite: Aero 445

Aero 451, 452, 453 Airplane Detail Design

(2) (2) (2)

Two three-hour drafting periods, fall, winter, and spring quarters, senior year. Applications of the principles of the strength of materials to the design of castings, forgings, and extrusions. Design of aircraft sheet metal assemblies. Layout and detail design of aircraft structural and operational assemblies and installations.

Prerequisite: Aero 246, 306, 309

Aero 455 Aircraft Maintenance Techniques

(1)

One three-hour laboratory, winter quarter, senior year. Review of the phases of aircraft work, that require special skills preparatory to the practical examination for the Aircraft Mechanic's Certificate.

Prerequisites: Aero 333, 405

Aero 457 Aeronautical Laboratory

(1)

One three-hour laboratory, fall quarter, senior year. Use of laboratory instruments and the technique of obtaining experimental data.

Prerequisite: Aero 314

Aero 458 Aeronautical Laboratory

(1)

One three-hour laboratory, winter quarter, senior year. Introduction to experimental methods and interpretation of the data obtained to solve typical problems in the field of aeronautics.

Prerequisite: Aero 457

Aero 459 Aeronautical Laboratory

(1)

One three-hour laboratory, spring quarter, senior year. Special problems in aeronautics.

Prerequisite: Aero 457

Aero 461, 462 Undergraduate Thesis

(2) (2)

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

Aero 463 Undergraduate Seminar

(2)

Two one-hour meetings, spring quarter, senior year. Discussion of the new developments in the field of aeronautics.

DESCRIPTIONS OF TECHNICAL COURSES IN AERONAUTICS**Aero 11 Aircraft Powerplant Fundamentals**

(3)

Two one-hour lectures and one three-hour laboratory, fall quarter, freshman year. History and development of aircraft engines as to types, cylinder arrangements, cooling systems. Nomenclature of engine components and the relationship of parts. Disassembly procedures, and the use, care, and application of the proper tools.

Aero 12 Aircraft Engine Operation Principles

(3)

Two one-hour lectures and one three-hour laboratory, winter quarter, freshman year. Principles of engine operation: two- and four-stroke cycle principle, piston displacement, volumetric efficiency, compression ratio, horsepower calculations, analysis of the Otto cycle, power overlap, valve overlap, crankshaft rotation, cam speeds and rotation, derivation of firing order, and valve actuating mechanism.

Prerequisite: Aero 11

Aero 13 Aircraft Engine Construction Practice

(3)

Two one-hour lectures and one three-hour laboratory, spring quarter, freshman year. Engine design and construction practices dealing with material specifications, surface finishes, vibration control, cooling systems, engine sections, induction systems, superchargers, CAA regulations pertaining to the replacement of parts, airworthiness, and proof of conformity as applied to overhaul, inspection, and maintenance of certificated aircraft engines.

Prerequisite: Aero 12

Aero 21 Basic Aircraft Woodwork

(3)

Two one-hour lectures and one three-hour laboratory, fall quarter, freshman year. Selection, care, and use of hand and power woodworking tools applicable to construction and repair of aircraft; fundamentals and specifications for selection of woods and glues and their use in aircraft; procedure for layout and construction of a wood wing rib; applicable CAA regulations.

Aero 22 Aircraft Woodwork

(3)

Two one-hour lectures and one three-hour laboratory, winter quarter, freshman year. Procedures and CAA regulations governing repairs of wood wing ribs and spars and plywood covering; the internal rigging of airplane structures; inspection and preparation of a structure for covering.

Prerequisite: Aero 21

Aero 23 Aircraft Covering and Finishing

(3)

Two one-hour lectures and one three-hour laboratory, spring quarter, freshman year. CAA specifications for selection and use of textile and finishing materials; processes for application of fabric and dope; principles of paint spray gun and accessories; techniques of brush and spray gun application of dope and the sanding operations; repairs for damaged fabric.

Prerequisite: Aero 22

Aero 41 Aircraft Engine Electrical Systems

(4)

Two one-hour lectures and two three-hour laboratory periods, fall quarter, sophomore year. Principles of electricity and batteries as applied to magnetos, battery ignition, starter systems and control units, spark plugs, ignition harness, and auxiliary starting methods. Disassembly, inspection, assembly, and test of various electrical units as outlined by the manufacturer. Construction of electrical circuits as applied to active aircraft, according to proper test and repair procedures.

Prerequisite: Aero 13

Aero 42 Aircraft Engine Carburetion and Fuel Systems (4)

Two one-hour lectures and two three-hour laboratory periods, winter quarter, sophomore year. Fuels, fuel systems, induction systems, and superchargers. Theory and principles of float and pressure carburetors, types, nomenclature, common troubles and methods of correction. Accessories of fuel systems and CAA regulations that apply to fuel systems.

Prerequisite: Aero 13

Aero 43 Aircraft Propellers (4)

Two one-hour lectures and two three-hour laboratory periods, spring quarter, sophomore year. Propeller theory, types and classification, materials of construction, and nomenclature. Principles of operation of fixed pitch, constant speed, hydromatic, and electric propellers. Inspection, installation, maintenance, and service procedures of propeller governors and CAA regulations pertaining to new propellers and all types of propeller repairs.

Prerequisite: Aero 13

Aero 51 Aircraft Materials and Processes (4)

Two one-hour lectures and two three-hour laboratories, fall quarter, sophomore year. Metal materials used in aircraft construction and the processes employed in shaping, finishing, and joining during assembly. Applicable CAA regulations.

Aero 52 Aircraft Hydraulic and Control Systems (4)

Two one-hour lectures and two three-hour laboratories, winter quarter, sophomore year. Operation and adjustment of various hydraulic units. Trouble shooting of the different types of hydraulic systems. Hydraulic plumbing, fluids, fluid seals, landing gear shock struts, and applicable CAA regulations.

Aero 53 Aircraft Electrical Systems (3)

Two one-hour lectures and one three-hour laboratory, spring quarter, sophomore year. Laws of electricity, as applied to electrical units and systems. Electrical system load analysis, circuit protection methods, and components such as conduit, conductors, voltage regulators, motors, inverters, etc. Applicable CAA regulations.

Aero 59 Aircraft Inspection and Line Service (1)

One three-hour laboratory, spring quarter, sophomore year. Typical daily, pre-flight, and periodic inspections, weight and balance of aircraft, general line service, pertinent CAA forms.

Prerequisites: Aero 23, 51, 52, 53

Aero 61 Aero Drafting Laboratory (1)

One three-hour laboratory, fall quarter, sophomore year. Use of drafting machines and development of drafting technique, with emphasis on neatness, arrangement, and lettering.

Prerequisite: ME 121

Aero 62 Aero Drafting Laboratory (1)

One three-hour laboratory, winter quarter, sophomore year. Practical problems in elementary descriptive geometry as applied to aircraft.

Prerequisite: Aero 61

Aero 63 Aero Drafting Laboratory (1)

One three-hour laboratory, spring quarter, sophomore year. AN standards, manufacturers' drafting room manuals, and CAA requirements as applied to aircraft design, maintenance, repair, and overhaul.

Prerequisite: Aero 62

Aero 71 Aircraft Engine Repair Procedure (4)

Two one-hour lectures and two three-hour laboratories, fall quarter, junior year. Disassembly, inspection, and repair procedure for the engine as outlined in the manufacturers' manuals.

Prerequisites: Aero 13, 41, 42

Aero 72 Aircraft Engine Lubrication

(4)

Two one-hour lectures and two three-hour laboratories, winter quarter, junior year. Theory of lubrication oils and lubricating systems, types of oiling systems. CAA regulations that apply to the installation, securing, maintenance, and repair of oiling systems.

Prerequisite: Aero 71

Aero 73 Aircraft Engine Overhaul Procedure

(2)

Two three-hour laboratories, spring quarter, junior year. Inspection, repair, overhaul, and assembly of aircraft engines, with special emphasis of the general repair and replacement of parts. Use of the manufacturers' table of limits as a guide in operations involving the fits, clearances, pressures, and application of torque values to be employed.

Prerequisite: Aero 72

Aero 74 Aircraft Engine Installation and Removal

(2)

One one-hour lecture and one three-hour laboratory, fall quarter, junior year. Design ideas and construction of engine mounts; cooling systems and cowling; induction and exhaust systems, and materials of construction; types of controls; installation of tubing used in the oil and fuel systems; electrical cables and connections; applicable CAA regulations.

Aero 75 Aircraft Engine Testing and Trouble Shooting

(2)

One one-hour lecture and one three-hour laboratory, winter quarter, junior year. Run in and test procedures as outlined by the engine manufacturers; malfunctioning of units and the procedure for their correction.

Prerequisite: Aero 74

Aero 76 Aircraft Engine Installation and Removal

(1)

One three-hour laboratory, spring quarter, junior year. Checking of the magneto and valve timing, adjustment of valve clearance, and general inspection after testing.

Aero 78 Civil Air Regulations

(1)

One one-hour lecture, winter quarter, junior year. Review of all CAA regulations that apply to the maintenance, repair, overhaul, and recertification of civil aircraft.

Aero 81 Aircraft Maintenance

(4)

Two one-hour lectures and two three-hour laboratories, fall quarter, junior year. Aircraft disassembly, inspection, reassembly, checking, and rigging preparatory to test flight; problems in aircraft weight and balance; applicable CAA regulations and safety practices.

Prerequisites: Aero 23, 51, 52, 53, 59

Aero 82 Aircraft Repair Procedures

(4)

Two one-hour lectures and two three-hour laboratories, winter quarter, junior year. Inspection methods and procedures, cost estimating of repairs, maintenance and overhaul, safety practices, materials and processes, and applicable CAA regulations.

Prerequisite: Aero 81

Aero 83 Aircraft Repair Procedures

(2)

Two three-hour laboratories, spring quarter, junior year. Use and care of hand and machine tools peculiar to the maintenance, repair, and overhaul of aircraft. Building of fabrication fixtures and jigs.

Prerequisite: Aero 82

Aero 84 Aircraft Overhaul, Maintenance, and Repair

(2)

One one-hour lecture and one three-hour laboratory, fall quarter, junior year. Review of aircraft servicing, maintenance, repair, and overhaul practices and procedures preparatory to the CAA examinations.

Prerequisite: Aero 59

Aero 85 Aircraft Maintenance Techniques

(1)

One three-hour laboratory, winter quarter, junior year. Review of the phases of aircraft work that require special skills preparatory to the practical examination for the aircraft mechanic's certificate.

Prerequisites: Aero 78, 83

Aero 86 Aircraft Overhaul, Maintenance, and Repair**(1)**

One three-hour laboratory, spring quarter, junior year. Additional practice and experience in the various phases of aircraft construction. The completion of this course qualifies the student to take the CAA examinations for an aircraft mechanic's certificate.

Prerequisites: Aero 84, 85

Aero 97, 98, 99 Technical Aerodynamics**(3) (3) (3)**

Three one-hour lectures, fall, winter, and spring quarters, junior year. Fundamentals of air-flow, physical properties of air, theory of flight, and performance methods.

AIR CONDITIONING AND REFRIGERATION ENGINEERING DEPARTMENT

Department Head, NORMAN SHARPE

THEODORE G. GRAVES
GEORGE GEORGE
O. HIGHUM

JAMES MCGRATH
FRANKLIN B. SHESLER*
I. G. VAN NEST

Although refrigeration and air conditioning are not new fields, their growth has been so rapid within the past two decades that many people consider them as such. The refrigeration and air conditioning field is now one of the major divisions of mechanical engineering. Refrigeration or air conditioning, in some form, now deals with the food we eat, the manufacture of the clothes we wear, and the manufacture of almost every other type of product we use. Home heating systems have been greatly improved. In addition, air conditioning for comfort has become important in public buildings, theaters, stores, etc.

Facilities

The college has modern, well-equipped laboratories for this department, having a total of more than 6,720 square feet of floor space, and equipment having a value conservatively estimated at \$75,000. These laboratories comprise a refrigerating laboratory, a heating and ventilating laboratory, and a sheet metal shop. In addition to the use of these laboratories, the technical student does extensive work in the welding and machine shops.

Degree Curriculum

The four-year curriculum leading to the Bachelor of Science degree in engineering is a full mechanical curriculum with a four-year major in refrigeration and air conditioning. Related subjects, such as physics, chemistry, calculus, strength of materials, thermodynamics, etc., are taken concurrently with the major subject in the appropriate year. Upon completing this curriculum, the student will be prepared for any type of engineering work required in the air conditioning and refrigeration field.

Technical Curriculum

The three-year technical curriculum is entirely separate from the degree curriculum. It emphasizes the construction, maintenance, and repair phases of the field. Theoretic analysis of only the basic systems is included. Upon the completion of this curriculum the student will be qualified to handle the maintenance or repair of refrigeration, steam heating, and air conditioning equipment. This curriculum is recommended for the student who wishes to open a repair shop or a small contracting shop of his own.

Two-year Technical Curriculum

A vocational certificate will be awarded to a student who successfully completes the first two years of the technical curriculum.

Placement

People of varied abilities are employed in this general field; men are employed as equipment designers, consulting engineers, system designers, dealers, contractors, sales engineers, skilled craftsmen, maintenance engineers, and repairmen. The four-year curriculum, leading to the Bachelor of Science degree, prepares the student for the engineering phases of this field. The three-year and two-year curricula, leading to the technical and vocational certificates, train the student in the maintenance and repair phases of the field.

* On military leave.

**DEGREE CURRICULUM IN AIR CONDITIONING AND REFRIGERATION
ENGINEERING**

Freshman Year	F	W	S
Air Conditioning Survey (AC 118)-----		1	
Algebra (Math 107, 108)-----	3	3	
Analytic Geometry (Math 109)-----			3
Physics (PSc 131, 132, 133)-----	4	4	4
English (Eng 104, 105, 106)-----	3	3	3
Health and Hygiene (PE 107)-----			2
Refrigeration Survey (AC 104)-----	3		
Refrigeration Codes (AC 105)-----		2	
Refrigeration Principles (AC 106)-----			2
Refrigeration Skills (AC 144, 145, 146)-----	1	1	1
Welding (ME 151, 152, 153)-----	1	1	1
Engineering Drafting (ME 121, 122, 123)-----	2	2	2
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
	17 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Sophomore Year			
Calculus (Math 201, 202, 203)-----	3	3	3
Engineering Mechanics (PSc 201)-----	3		
Strength of Materials (ME 202, 203)-----		3	3
Electricity (EE 223, 208, 209)-----	4	3	3
Plumbing and Building Sanitation (ME 331)-----	4		
Public Speaking (Eng 201)-----		2	
Sheet Metal (AC 223)-----			2
Heating and Ventilating (AC 201, 202, 203)-----	3	3	3
Heating and Ventilating Engineering Practice (AC 242, 243)-----		2	2
Physical Education-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Elective-----		1	1
	17 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Junior Year			
General Chemistry (PSc 321, 322, 323)-----	4	4	4
American Government (Pol Sc 301)-----	3		
Survey of U. S. History (Hist 304)-----		3	
Industrial Economics (Econ 313)-----			3
Refrigeration Engineering (AC 301, 302, 303)-----	3	3	3
Refrigeration Engineering Practice (AC 341, 342, 343)-----	2	2	2
Air Conditioning Tests and Measurements (AC 332, 333)-----		2	2
Fluid Flow (ME 311, 312)-----	3	3	
Heat Transfer (ME 313)-----			3
Electives-----	3	1	1
	18	18	18
Senior Year			
Industrial Management (Econ 411)-----	3		
Industrial Relations (Econ 412)-----		3	
* Background of Modern Affairs (Hist 305)-----			3
Family Psychology (Psy 403)-----			3
Thermodynamics (ME 401, 402)-----	3	3	
Undergraduate Thesis (AC 461, 462)-----	2	2	
Undergraduate Seminar (AC 463)-----			2
Air Conditioning Engineering (AC 401, 402, 403)-----	3	3	3
Air Conditioning Engineering Practices (AC 441, 442, 443)-----	2	2	2
Electives-----	5	4	5
	18	17	18

* State and Local Government (Pol. Sc. 401) may be substituted.

TECHNICAL CURRICULUM IN REFRIGERATION MAINTENANCE AND REPAIR

	Freshman Year	F	W	S
Mathematics (Math 11, 12, 13) -----		3	3	3
Physics (PSc 11, 12, 13) -----		3	3	3
Chemistry (PSc 22, 23) -----			3	3
Health and Hygiene (PE 107) -----				2
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Survey of A. C. (AC 12) -----			1	
Machine Shop (ME 141, 142, 143) -----		1	1	1
Drafting (ME 121, 122, 123) -----		2	2	2
Refrigeration Survey (AC 21) -----		3		
Refrigeration Codes (AC 22) -----			2	
Refrigeration Principles (AC 23) -----				2
Refrigeration Skills (AC 24, 25, 26) -----		1	1	1
Welding (ME 151, 152, 153) -----		1	1	1
Electives -----		3		
		<u>17$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>	<u>18$\frac{1}{2}$</u>
	Sophomore Year			
English (Eng 11, 12, 13) -----		3	3	3
Electricity (EI 31, 32, 33) -----		4	3	3
American Government (Pol Sc 42) -----			3	
Machine Shop (ME 241, 242, 243) -----		1	1	1
Welding (ME 251, 252, 253) -----		1	1	1
* Heating and Ventilating (AC 41, 42, 43) -----		3	3	3
Technical Refrigeration (AC 51, 52, 53) -----		3	3	3
Refrigeration Shop (AC 54, 55, 56) -----		2	2	2
Physical Education (PE 241, 242, 243) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
		<u>17$\frac{1}{2}$</u>	<u>19$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>
	Junior Year			
American History (Hist 41) -----		2		
Technical Air Conditioning (AC 71, 72, 73) -----		3	3	3
Sheet Metal (AC 81, 82, 83) -----		2	2	2
Air Conditioning Tests and Measurements (AC 78, 79) -----			2	2
Heating and Ventilating Shop (AC 84, 85, 86) -----		2	2	2
Plumbing and Building Sanitation (ME 55) -----		4		
Electives -----		4	5	7
		<u>17</u>	<u>17</u>	<u>16</u>

TWO-YEAR TECHNICAL CURRICULUM

The two-year technical curriculum in Air Conditioning and Refrigeration consists of the first two years of the three-year technical curriculum.

DESCRIPTIONS OF COURSES IN AIR CONDITIONING AND REFRIGERATION ENGINEERING**AC 104 Refrigeration Survey (3)**

Three one-hour lectures, fall quarter, freshman year. A descriptive treatment of refrigerating principles and a survey of current practices. To be taken concurrently with PSc 131 and Math 107.

AC 105 Refrigeration Codes (2)

Two one-hour lectures, winter quarter, freshman year. A study of American Standards Association and Underwriters' Safety Codes as applied to refrigeration.

Prerequisite: AC 104

AC 106 Refrigeration Principles (2)

Two one-hour lectures, spring quarter, freshman year. A simple mathematical treatment of refrigerating principles of the single stage system and the calculation of the refrigerating load.

* Elective in two-year Technical Program.

AC 118 Air Conditioning Survey

(1)

One-hour lecture, winter quarter, freshman year. A descriptive treatment of air conditioning with special emphasis on the requirements and aptitudes of engineers in this field.

AC 122 Sheet Metal Shop Practice

(2)

One hour lecture and one three-hour laboratory, winter quarter, freshman year. Familiarization with basic sheet metal techniques, selection of materials, use and care of sheet metal tools and equipment, and design and construction of radio chassis, hoods, cabinets, etc. Primarily for Electronic students.

AC 144, 145, 146 Refrigeration Skills

(1) (1) (1)

One three-hour laboratory; fall, winter, and spring quarters; freshman year. Practice in the proper use and care of tools common to the refrigeration industry; practice in the operation of refrigerating systems; diagnosis of trouble and repair of all elements of the refrigerating system.

AC 201, 202, 203 Heating and Ventilating Engineering

(3) (3) (3)

Three one-hour lectures; fall, winter, and spring quarters; sophomore year. The course includes the study of equipment and its application to all common types of systems for homes, factories, and public buildings.

AC 204 Heating and Ventilating

(3)

Three one-hour lectures, fall quarter, sophomore year. For mechanical engineering and architectural engineering students. A survey of heating equipment and its selection as used in homes, industrial, and public buildings.

Prerequisites: ME 123, PSc 133, Math 109

AC 223 Air Conditioning Sheet Metal

(2)

One-hour lecture and one three-hour period in the sheet metal shop, spring quarter, sophomore year. A study of the materials and techniques of duct construction.

Prerequisite: ME 123

AC 240 Additional Engineering Laboratory

(1-2)

One or two three-hour laboratories, any quarter, sophomore year. Total credit limited to four units, with not more than two units in any one quarter.

AC 241 Heating and Ventilating Engineering Practice

(2)

Two three-hour drafting room periods, fall or winter quarter, sophomore year. For mechanical and architectural engineering students. Practice in the planning of piping and duct systems for heating and ventilating. To be taken concurrently with AC 204.

AC 242, 243 Heating and Ventilating Engineering Practice

(2) (2)

Two three-hour drafting room periods, winter and spring quarters, sophomore year. The engineering of a few representative systems studied in AC 201, 202, 203. Individual projects.

AC 237, 238 Dairy Refrigeration

(2) (2)

One-hour lecture and one three-hour laboratory, fall and winter quarters, sophomore year. For dairy manufacturing and dairy husbandry majors. The operation, maintenance, and management of refrigeration equipment as applied to the dairy industry.

AC 239 Steam Boilers and Equipment

(2)

One-hour lecture and one three-hour laboratory, spring quarter, sophomore year. For dairy manufacturing and dairy husbandry majors. The operation, maintenance, and management of steam equipment as applied to the dairy industry.

AC 301, 302, 303 Refrigeration Engineering

(3) (3) (3)

Three one-hour lectures; fall, winter, and spring quarters; junior year. The principles involved in the design of refrigerating equipment and their application to single and multiple stage systems.

Prerequisites: AC 106, Math 203

AC 332, 333 Air Conditioning Tests and Measurements (2) (2)

One-hour lecture and one three-hour laboratory period; winter and spring quarters; junior year. The study of accurate measurement of fluid flow, heat quantities, water, oil, and air properties as involved in refrigeration and air conditioning.

Prerequisites: AC 106, 203

AC 341, 342, 343 Refrigeration Engineering Practice (2) (2) (2)

Two three-hour drafting room periods; fall, winter, and spring quarters; junior year. The course consists of the design of a few representative pieces of heat transfer equipment and the design of refrigerating systems as applied to warehouses, locker plants, etc. Individual projects.

AC 400 Special Problems for Advanced Undergraduates (1-2)

One or two three-hour laboratories, any quarter, senior year. Total credit limited to four units, with not more than two units in any one quarter.

AC 401, 402, 403 Air Conditioning Engineering (3) (3) (3)

Three one-hour lectures; fall, winter, and spring quarters; senior year. A rational analysis of the selection of equipment and design of systems as used in industrial and public buildings.

Prerequisites: Math 203, AC 203, ME 312, 313, AC 303. If necessary, any of the last four subjects may be taken concurrently with this course.

AC 441, 442, 443 Air Conditioning Engineering Practice (2) (2) (2)

Two three-hour drafting room periods; fall, winter, and spring quarters; senior year. Engineering of an extended duct system; engineering of a system for a theatre or other public assembly involving the year-round control of temperature, humidity and ventilation; engineering of a system for a public building such as an office building or library. To be taken concurrently with AC 402, 403, 442, 443.

AC 461, 462 Undergraduate Thesis (2) (2)

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

AC 463 Undergraduate Seminar (2)

Two one-hour meetings, spring quarter, senior year. Reports on the refrigeration and air conditioning field. Topics assigned so that a definite line of investigation is followed each quarter.

**DESCRIPTIONS OF COURSES IN TECHNICAL CURRICULA OF
AIR CONDITIONING AND REFRIGERATION****AC 12 Survey of Air Conditioning (1)**

One hour lecture, winter quarter, freshman year. A descriptive treatment of air conditioning with special emphasis of the duties and requirements of a repair man and a maintenance engineer.

AC 21 Refrigeration Survey (3)

Three one-hour lectures, fall quarter, freshman year. A descriptive treatment of refrigerating principles and a survey of current practices.

AC 22 Refrigeration Codes (2)

Two one-hour lectures, winter quarter, freshman year. A study of American Standards Association and Underwriters' Safety Codes as applied to refrigeration.

Prerequisite: AC 21

AC 23 Refrigeration Principles (2)

Two one-hour lectures, spring quarter, freshman year. A simple mathematical treatment of refrigerating principles of the single stage system and the calculation of the refrigeration load.

Prerequisite: AC 21

AC 24, 25, 26 Refrigeration Skills

(1) (1) (1)

One three-hour laboratory; fall, winter, and spring quarters; freshman year. Practice in the proper use and care of tools common to the refrigeration industry; practice in the operation of refrigerating systems; diagnosis of trouble; and the repair of all elements of the refrigerating system.

AC 41, 42, 43 Heating and Ventilating

(3) (3) (3)

Three one-hour lectures; fall, winter, and spring quarters; sophomore year. The basic principles of heating and ventilating, with consideration of all types of equipment and systems in common use. Special emphasis on construction, operation, and maintenance.

Prerequisites: PSc 13, Math 13, ME 123

AC 44 Heating and Ventilating Layout

(2)

Two three-hour drafting room periods, fall or winter quarter, sophomore year. Practice in the planning and drafting of piping and duct systems for heating and ventilating.

AC 47 Heating and Ventilating

(3)

Three one-hour lectures, fall or winter quarter, sophomore year. For technical mechanical and architectural students. A survey of heating equipment and its selection for homes and industrial buildings.

Prerequisite: ME 123, PSc 13, Math 13

AC 51, 52, 53 Technical Refrigeration

(3) (3) (3)

Three one-hour lectures; fall, winter, and spring quarters; sophomore year. Refrigerating principles as applied to single and multiple stage systems. Special emphasis on repair, construction, operation, and maintenance.

Prerequisites: PSc 2, Math 13, ME 123

AC 54, 55, 56 Refrigeration Shop

(2) (2) (2)

One hour meeting and one three-hour shop; fall, winter, and spring quarters; sophomore year. Practice in shop sketches, diagnosis of trouble, repair, operation, and maintenance of single and multiple stage refrigerating systems.

Prerequisites: PSc 3, Math 13, ME 123

AC 71, 72, 73 Technical Air Conditioning

(3) (3) (3)

Three one-hour lectures; fall, winter, and spring quarters; junior year. The basic principles of year-round control of temperature, humidity, and ventilation, with special emphasis on operation, repair, and maintenance.

Prerequisites: AC 43, 53

AC 78, 79 Air Conditioning Tests and Measurements

(2) (2)

One hour lecture and one three-hour laboratory; fall, winter, or spring quarter; junior year. The principles and practices of testing and measuring lubricants, water, psychrometry, heat transfer, and fluid flow with applications to refrigeration and air conditioning.

Prerequisite: AC 43, 53

AC 81, 82, 83 Sheet Metal

(2) (2) (2)

One hour meeting and one three-hour shop; fall, winter, and spring quarters; junior year. The design and construction of duct systems, apparatus connections, exhaust systems, and hoods.

AC 84, 85, 86 Heating and Ventilating Shop

(2) (2) (2)

One hour meeting and one three-hour shop; fall, winter, and spring quarters; junior year. The maintenance and operation of boilers, oil burners, vacuum heating pumps, and steam traps; the testing of boiler feed water and the analysis of flue gases.

Prerequisite: AC 43

ARCHITECTURAL ENGINEERING DEPARTMENT

GEORGE HASSLEIN, Department Head

GEORGE BROWN

HANS MAGER

The practice of architecture and the many fields of the building industry entail the services of numerous highly skilled men. It is recognized that a large percentage of these men are engaged in the engineering and structural phases of the architectural profession and the building industry.

Courses offered in the department of architectural engineering are designed to prepare the student for activities in these fields.

It should be realized by students considering these courses that they are offered as a major department in engineering rather than a division of fine arts. Purely architectural subjects are offered only to the extent of providing the student with a sympathetic understanding of the problems of architectural practice and design.

Facilities

The facilities include well-lighted drafting rooms, and studios with appropriate library and catalog facilities readily available to the students. Equipment and conditions throughout the department are designed to carry out an atmosphere paralleling that found in the architectural profession and the building industry.

Reproduction facilities are available for blue printing and other methods of reproduction.

Degree Curriculum

The four-year course leading to a Bachelor of Science degree in Architectural Engineering is offered for students desiring an educational background for entering the engineering fields of architecture, building and construction.

Technical Curriculum

The three-year technical curriculum is planned for students desiring training in drafting room skills related to the architectural profession and the building industries. The work in both the related and major courses is less advanced than the work in the degree curriculum.

Two-year Technical Curriculum

A two-year technical certificate will be awarded to a student who successfully completes the first two years of the technical curriculum.

Placement

Graduates will find employment as junior draftsmen and junior engineers in architects' offices, large construction firms, large contracting companies, and building materials organizations. According to their special interests, some of the graduates will find placement opportunities as estimators, construction supervisors, structural designers, detailers, building contractors, and sales engineers.

DEGREE CURRICULUM IN ARCHITECTURAL ENGINEERING

	Freshman Year	F	W	S
Physics (PSc 131, 132, 133)		4	4	4
Algebra (Math 107, 108)		3	3	
Analytic Geometry (Math 109)				3
Engineering Drafting (ME 121)		2		
Physical Education (PE 141, 142, 143)		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Descriptive Geometry (ME 125, 126)			3	3
English (Eng 104, 105, 106)		3	3	3
Fundamentals of Architectural Drafting (Arch 101)		2		
Materials of Construction (Arch 102, 103)			2	2
Architectural Drafting (Arch 141, 142, 143)		3	3	3
		<u>17$\frac{1}{2}$</u>	<u>18$\frac{1}{2}$</u>	<u>18$\frac{1}{2}$</u>

Sophomore Year			
	F	W	S
Calculus (Math 201, 202, 203) -----	3	3	3
Public Speaking (Eng 201) -----	2		
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----			2
Engineering Mechanics (PSc 201) -----	3		
Strength of Materials (ME 202, 203) -----		3	3
Heat and Ventilating (AC 204) -----	3		
Heating and Ventilating Practice (AC 241) -----	2		
Plumbing and Building Sanitation (ME 331) -----		4	
General Codes and Wiring Practices (EE 223) -----			4
Fundamentals of Delineation (Arch 246, 247) -----		2	2
Fundamentals of Perspective Drawings (Arch 245) -----	2		
Architectural Drafting (Arch 241, 242, 243) -----	3	3	3
Quantity Surveying and Estimating (Arch 202, 203) -----		2	2
	18$\frac{1}{2}$	17$\frac{1}{2}$	19$\frac{1}{2}$
Junior Year			
General Chemistry (PSc 321, 322, 323) -----	4	4	4
American Government (Pol. Sc 301) -----	3		
Survey of U. S. History (Hist 304) -----		3	
Industrial Economics (Ec 313) -----			3
Architectural Appreciation (Arch 304) -----	3		
Codes, Specifications and Contracts (Arch 302, 303) -----		2	2
Architectural Design (Arch 341, 342, 343) -----	3	3	3
Graphical Analysis of Structures (Arch 324) -----	3		
Structural Steel and Timber Design (Arch 305) -----		3	
Reinforced Concrete (Arch 306) -----			3
Electives -----		3	2
	16	18	17
Senior Year			
Industrial Relations (Ec 412) -----		3	
Industrial Management (Ec 411) -----	3		
* Background of Modern Affairs (Hist 305) -----			3
Family Psychology (Psy 403) -----			3
Undergraduate Thesis (Arch 461, 462) -----	2	2	
Undergraduate Seminar (Arch 463) -----			2
Advanced Architectural Engineering Design (Arch 401, 402, 403) -----	2	2	2
Advanced Architectural Engineering Work Shop (Arch 441, 442, 443) -----	3	3	3
Engineering Surveying (ME 431, 432, 433) -----	2	2	2
Electives -----	5	5	2
	17	17	17

TECHNICAL CURRICULUM IN ARCHITECTURAL INDUSTRIES

Freshman Year			
	F	W	S
Mathematics (Math 11, 12, 13) -----	3	3	3
Physics (PSc 11, 12, 13) -----	3	3	3
Engineering Drafting (ME 121, 122, 123) -----	2	2	2
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----			2
Fundamentals of Architectural Drafting (Arch 11) -----	2		
Materials of Construction (Arch 12, 13) -----		2	2
Architectural Drafting (Arch 41, 42, 43) -----	3	3	3
Technical English (Eng 11, 12, 13) -----	3	3	3
	16$\frac{1}{2}$	16$\frac{1}{2}$	18$\frac{1}{2}$

* State and Local Government (Pol. Sc. 401) may be substituted.

Sophomore Year	F	W	S
American Government (Pol Sc 42) -----		3	
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Heating and Ventilating (AC 47) -----	3		
Heating and Ventilating Layout (AC 44) -----	2		
Plumbing and Building Sanitation (ME 55) -----		4	
General Codes and Wiring Practices (EI 31) -----			4
Quantity Surveying and Estimating (Arch 22, 23) -----		2	2
Fundamental Delineation (Arch 55, 56) -----		2	2
Architectural Drafting (Arch 51, 52, 53) -----	3	3	3
Fundamental Perspective Drawing (Arch 71) -----	2		
Analytic Mechanics (ME 44) -----	3		
Strength of Materials (ME 45, 46) -----		3	3
Electives -----	5	1	3
	<hr/> 18 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Junior Year			
American History (Hist 41) -----	2		
Family Psychology (Psy 403) -----			3
Architectural Appreciation (Arch 81) -----	3		
Codes, Specifications, Contracts (Arch 72, 73) -----		2	2
Architectural Design (Arch 61, 62, 63) -----	3	3	3
Engineering Surveying (ME 431, 432, 433) -----	2	2	2
Electives -----	8	10	8
	<hr/> 18	<hr/> 17	<hr/> 18

TWO-YEAR TECHNICAL CURRICULUM

The first two years of the technical curriculum comprise the two-year technical curriculum in Architectural Industries.

DESCRIPTIONS OF COURSES IN ARCHITECTURAL ENGINEERING

Arch 101 Fundamentals of Architectural Drafting (2)

Two one-hour lectures, fall quarter, freshman year. The basic principles of architectural drafting and the special techniques and methods used in developing working drawings. Sources of special equipment and manufacturers' data.

Arch 102, 103 Materials of Construction (2) (2)

Two one-hour lectures, winter and spring quarters, freshman year. Building materials and the structural make-up of buildings. Building materials and their general use and application.

Arch 141 Architectural Drafting (3)

Three three-hour laboratories, fall quarter, freshman year. Practical drafting room work in architectural drafting techniques and standards. Progress from tracing to the development of simple working drawing assignments.

Arch 142, 143 Architectural Drafting (3) (3)

Three three-hour laboratory periods, winter and spring quarters, freshman year. Assignments similar to problems confronting a draftsman in an office. Student initiative encouraged by original thought problems rather than stock or standard details. This prevails in all architectural drafting courses.

Arch 202, 203 Quantity Surveying and Estimating (2) (2)

Two one-hour lectures, winter and spring quarters, sophomore year. Methods used in estimating building construction costs. Problems in estimating material, labor, and equipment costs for various trades and parts of construction. Development of estimates from plans and specifications.

Arch 205, 206 Theory of Architectural Design (3) (3)

Three one-hour lectures, winter and spring quarters, sophomore year. Study of logic pertaining to fundamental functions of aesthetics, structure and economics, as applied to architectural design.

Prerequisite: Permission of instructor.

Arch 241, 242, 243 Architectural Drafting (3) (3) (3)

Three three-hour laboratories, fall, winter, and spring quarters, sophomore year. Practical drafting room work consisting of advanced detailing as it pertains to larger structures. Development of complete working drawings for medium-sized commercial buildings. Development of complete working drawings for large reinforced concrete structures, with students working in squads under actual office conditions.

Arch 245 Fundamentals of Perspective Drawing (2)

One one-hour lecture and one three-hour laboratory, fall quarter, sophomore year. Basic principles, methods, and expedients for producing mechanically accurate or freehand perspective drawings.

Arch 246, 247 Fundamentals of Delineation (2) (2)

Two three-hour laboratories, winter and spring quarters, sophomore year. Free-hand drawing in line, light and shade from simple still life forms, and outdoor subjects in charcoal, pencil, and watercolor.

Arch 302, 303 Codes, Specifications, and Contracts (2) (2)

Two one-hour lectures, winter and spring quarters, junior year. The aims, structure, and effects of building codes in general; the Uniform Building Code, its related codes, ordinances, etc.; its use and application. The general elements, structure, and purpose of specifications, specification writing. The legal aspects of construction, involving the architect and builder, and the makeup and purpose of contracts.

Arch 304 Architectural Appreciation (3)

Three one-hour lectures, fall quarter, junior year. A chronological study of the history of architecture and its related forms from prehistoric times through the present.

Arch 305 Structural Steel and Timber Design (3)

Three one-hour lectures, winter quarter, junior year. Design of steel and timber structural components, structural connections, tension and compression members, beams, columns.

Arch 306 Reinforced Concrete Design (3)

Three one-hour lectures, spring quarter, junior year. Fundamentals and principles of reinforced concrete design.

Arch 307 Illumination Design (2)

Two one-hour lectures, spring quarter, junior year. Study of illumination requirements, light sources, and application to problems of aesthetics and structure in buildings.

Prerequisite: Junior standing in Architectural Engineering.

Arch 324 Graphical Analysis of Structures (3)

One one-hour lecture and two three-hour laboratories, fall quarter, junior year. Graphical analysis of forces, moments of inertia, bending moments, deflection, in beams, trusses, columns, and masonry structures.

Arch 341, 342, 343 Architectural Design (3) (3) (3)

Three three-hour laboratories, fall, winter, and spring quarters, junior year. An elementary study of design, the application of structural systems and materials to design and the functional aspects of architecture. A study of methods of approach to architectural problems.

Arch 400 Special Problems for Advanced Undergraduates (1-2)

One or two three-hour laboratories, any quarter, senior year. Total credit limited to four units, with not more than two units in any one quarter.

Arch 401, 402, 403 Advanced Architectural Engineering Design (2) (2) (2)

Two one-hour lectures; fall, winter, and spring quarters; senior year. Discussion of problems encountered in engineering, design, drawing, and construction of large buildings. Emphasis on analysis of problems involving selecting and setting up structural systems for various conditions.

Arch 441, 442, 443 Advanced Architectural Engineering Work Shop (3) (3) (3)

Three three-hour laboratories; fall, winter, and spring quarters; senior year. Preparation of complete architectural drawings from beginning: planning, sketches, and delineations to the final working drawings, specifications, estimates, and contracts. Emphasis placed on completeness of work from standpoint of engineering and advanced detailing.

Class organized to function as an architect's office. Students will have the opportunity to concentrate on particular phases of the class project in which their interests lie.

Arch 461, 462 Undergraduate Thesis (2) (2)

One two-hour meeting; fall and winter quarters; senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

Arch 463 Undergraduate Seminar (2)

Two one-hour meetings; spring quarter; senior year. A study of recent developments in the field of architecture; new and modern materials and methods, and their application; problems and questions of the new architectural draftsman; problems of placement and adaption in an architectural firm as well as other branches in the building industry.

DESCRIPTIONS OF TECHNICAL COURSES IN ARCHITECTURAL INDUSTRIES**Arch 11 Fundamentals of Architectural Drafting (2)**

Two one-hour lectures, fall quarter, freshman year. The basic principles of architectural drafting and the special techniques and methods used in developing working drawings. Sources of special equipment and manufacturers' data.

Arch 12, 13 Materials of Construction (2) (2)

Two one-hour lectures, winter quarter, freshman year. A study of building materials and the structural make-up of buildings. A comprehensive course to familiarize the student with building materials and their general use and application.

Arch 22, 23 Quantity Surveying and Estimating (2)

Two one-hour lectures, winter and spring quarters, sophomore year. Methods used in estimating building construction costs. Problems in estimating material, labor, and equipment costs for various trades and parts of construction.

Development of estimates from complete plans and specifications.

Arch 41 Architectural Drafting (3)

Three three-hour laboratories, fall quarter, freshman year. Practical drafting room work in architectural drafting techniques and standards. Progress from tracing to the development of simple working drawing assignments.

Arch 42, 43 Architectural Drafting (3) (3)

Three three-hour laboratories; winter and spring quarters; freshman year. Assignments similar to problems confronting a draftsman in an office. Student initiative encouraged by original thought problems rather than stock or standard details. This prevails in all architectural drafting courses.

Arch 51, 52, 53 Architectural Drafting (3) (3) (3)

Three three-hour laboratories, fall, winter, and spring quarters, sophomore year. Practical drafting room work consisting of advanced detailing as it pertains to larger structures. Development of complete working drawings for medium sized commercial buildings. Practical drafting room work consisting of the development of complete working drawings for large reinforced concrete structures, with students working in squads under actual office conditions.

Arch 55, 56 Fundamentals of Delineation**(2) (2)**

Two three-hour laboratories, winter and spring quarters, sophomore year. Free-hand drawing in line, light and shade from simple still life forms, and outdoor subjects in charcoal, pencil, and watercolor.

Arch 61, 62, 63 Architectural Design**(3) (3) (3)**

Three three-hour laboratories, fall, winter, and spring quarters, junior year. An elementary study of design, the application of structural systems and materials to design and the functional aspects of architecture. A study of methods of approach to architectural problems.

Arch 71 Fundamentals of Perspective Drawing**(2)**

One-hour lecture and one three-hour laboratory, fall quarter, sophomore year. A study of the basic principles, methods, and expedients for producing mechanically accurate or freehand perspective drawings.

Arch 72, 73 Codes, Specifications, and Contracts**(2) (2)**

Two one-hour lectures, winter and spring quarters, junior year. The aims, structure, and effects of building codes in general; the Uniform Building Code, its related codes, ordinances, etc.; its use and application. The general elements, structure, and purpose of specifications, and specification writing. The legal aspects of construction, involving the architect and builder, and the makeup and purpose of contracts.

Arch 81 Architectural Appreciation**(3)**

Three one-hour lectures, fall quarter, junior year. A chronological study of the history of architecture and its related forms from prehistoric times through the present.

ELECTRICAL ENGINEERING DEPARTMENT

FRED W. BOWDEN, Department Head

C. E. KNOTT

KERMIT ECKERT

WARREN R. ANDERSON

FRED H. STEUCK

The Electrical Engineering Department offers courses in the technical phases of work which are necessary in the preparation of students who desire to obtain a vocational certificate, a technical certificate, or the degree of Bachelor of Science in Electrical Engineering. The course material includes basic electrical theory and in addition emphasizes the practical aspects of the subject matter in a rapidly growing field. The student who completes one of the three curricula will find himself adequately trained not only in the basic theory of electrical work, but also in the practical knowledge of standard equipment and procedures used in the field.

Facilities

The Electrical Engineering Department occupies about 6,000 square feet of floor space, consisting of an electric shop, 20 x 80 feet, and an electrical engineering laboratory and office building, 40 x 110 feet, divided into three laboratories, a meter room, and three offices.

The main laboratory which is about 25 x 100 feet has direct and alternating current machinery and apparatus used principally in experiments and tests performed during the first two years of college training, and industrial electronic equipment for the third year.

Junior students receive the bulk of their laboratory training in a laboratory approximately 15 x 40 feet which has many fine pieces of precision electrical measurement and electronic equipment. The senior laboratory is 15 x 24 feet and is used for senior projects and illumination measurements and tests. The meter room has an adequate supply of electrical instruments of several types and makes for student use in laboratory courses.

In addition to using the electrical laboratory, students in the technical curriculum participate in electrical construction installations and maintenance on the college campus. The campus electrical distribution system, with its many types of electrical installations, provides an excellent laboratory for the technical student.

Degree Curriculum

The four-year curriculum in electrical engineering leads to the Bachelor of Science degree. For the engineering student, it provides training which covers a wide variety of applications in the field of electrical power and its utilization. Attention is also given to the increasing use of electronic control methods in the power field. Electrical theory and practice are introduced in the freshman year through lectures, recitations, laboratory work, and inspection trips to acquaint the student with the subject matter of his chosen field early in his college work.

Technical Curriculum

The department offers the student in this curriculum the necessary technical and practical training to aid him in advancing to a responsible position in the electrical industry. The technical curriculum is designed to suit the needs of the student whose time is limited or who is less interested in the more advanced work in electrical engineering. His training should equip him for positions in the electrical industry between those of the journeyman electrician and the engineer.

Two-year Technical Curriculum

The objective of this curriculum is to give a maximum of job-training in a minimum time. Only such science and related work is included as is necessary for the student to understand his major work. A vocational certificate is awarded to the student who satisfactorily terminates his work at the end of the second year of the technical curriculum.

Placement

The graduate of the Electrical Engineering curriculum may gain employment as an engineer with a construction company, an electric power company, a factory or manufacturing concern, a sales engineering office, or the telephone industry. Some individuals may wish to enter private business, or state or federal civil service.

For the two-year or three-year graduate in Electrical Industries, employment may be found as a technician for an electric power company, construction company, factory, telephone company, or a private electrical shop.

DEGREE CURRICULUM IN ELECTRICAL ENGINEERING

	Freshman Year	F	W	S
Physics (PSc 131, 132, 133)-----		4	4	4
Algebra (Math 107, 108)-----		3	3	
Analytic Geometry (Math 109)-----				3
Engineering Drafting (ME 121, 122, 123)-----		2	2	2
Physical Education (PE 141, 142, 143)-----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----				2
Elementary Theory of D.C. (EE 101)-----		3		
Direct Current Machinery (EE 102)-----			3	
Elementary Theory of A.C. (EE103)-----				3
Direct Current Circuit Laboratory (EE 141)-----		1		
Direct Current Machinery Laboratory (EE 142, 143)-----			1	1
Introduction to Electrical Engineering (EE 111)-----		2		
Electrical Safety Rules and Regulations (EE 112)-----			2	
Machine Shop (ME 141, 142, 143)-----		1	1	1
		$16\frac{1}{2}$	$16\frac{1}{2}$	$16\frac{1}{2}$
	Sophomore Year			
English (Eng 104, 105, 106)-----		3	3	3
Calculus (Math 201, 202, 203)-----		3	3	3
Physical Education (PE 241, 242, 243)-----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Engineering Mechanics (PSc 201)-----		3		
Strength of Materials (ME 202, 203)-----			3	3
Strength of Materials Laboratory (ME 249)-----				1
Alternating Current Circuits (EE 201)-----		3		
Alternating Current Machinery (EE 202, 203)-----			3	3
Alternating Current Laboratory (EE 241)-----		1		
Alternating Current Machinery Laboratory (EE 242, 243)-----			1	1
Electrical Drafting (EE 254, 255, 256)-----		1	1	1
Welding (ME 151, 152, 153)-----		1	1	1
Electives -----		3	3	3
		$18\frac{1}{2}$	$18\frac{1}{2}$	$18\frac{1}{2}$
	Junior Year			
General Chemistry (PSc 321, 322, 323)-----		4	4	4
Public Speaking (Eng 201)-----			2	
American Government (Pol Sc 301)-----		3		
Survey of United States History (Hist 304)-----			3	
Industrial Economics (Ec 313)-----				3
Fluid Flow (ME 311)-----		3		
Electrical Measurements (EE 301)-----		3		
Electrical Measurements Laboratory (EE 341)-----		1		
Introduction to Industrial Electronics (EE 302)-----			3	
Vacuum Tube Laboratory (EE 342)-----			1	
Industrial Electronics (EE 303)-----				3
Industrial Electronics Laboratory (EE 343)-----				1
Steam and Gas Engineering (EE 311, 312, 313)-----		3	3	3
Power Plant Laboratory (EE 351, 352, 353)-----		1	1	1
Electives -----		1	2	3
		19	19	18

Senior Year			
	F	W	S
Industrial Management (Ec 411)-----	3		
Industrial Relations (Ec 412)-----		3	
* Background of Modern Affairs (Hist 305)-----			3
Family Psychology (Psy 403)-----			3
Undergraduate Thesis (EE 461, 462)-----	2	2	
Undergraduate Seminar (EE 463)-----			2
Electrical Machine Design (EE 401)-----	3		
Telephone Engineering (EE 402)-----		3	
Illumination Engineering (EE 403)-----			3
Electrical Machine Design Laboratory (EE 441)-----	1		
Telephone Engineering Laboratory (EE 442)-----		1	
Illumination Engineering Laboratory (EE 443)-----			1
Engineering Surveying (ME 431, 432, 433)-----	2	2	2
Kinematics (ME 223)-----			3
Electives -----	6	6	
	17	17	17

TECHNICAL CURRICULUM IN ELECTRICAL INDUSTRIES

Freshman Year			
	F	W	S
Mathematics (Math 11, 12, 13)-----	3	3	3
Physics (PSc 11, 12, 13)-----	3	3	3
Engineering Drafting (ME 121, 122, 123)-----	2	2	2
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----	2		
Direct Current Circuits (EI 11)-----	3		
Direct Current Circuits Laboratory (EI 14)-----	1		
Direct Current Machinery (EI 12)-----		3	
Direct Current Machinery Laboratory (EI 15)-----		1	
AC Circuits and Machinery (EI 13)-----			3
AC Circuits and Machinery Laboratory (EI 16)-----			1
Welding (ME 151, 152, 153)-----	1	1	1
Machine Shop (ME 141, 142, 143)-----	1	1	1
National Electric Code (EI 21)-----	1		
Electric Safety Orders (EI 22)-----		1	
Overhead Line Construction (EI 23)-----			1
Electric Construction (EI 18, 19)-----	1	2	2
	18 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$

Sophomore Year			
	F	W	S
English (Eng 11, 12, 13)-----	3	3	3
American Government (Pol Sc 42)-----		3	
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
AC Circuits (EI 41)-----	3		
AC Circuit Laboratory (EI 44)-----	1		
AC Machinery (EI 42)-----		3	
AC Machinery Laboratory (EI 45)-----		1	
AC Machinery (EI 43)-----			3
AC Machinery Laboratory (EI 46)-----			1
Electrical Drafting (EI 54, 55, 56)-----	1	1	1
Electrical Construction (EI 51, 52, 53)-----	2	2	2
Power Plant Operation (ME 51, 52, 53)-----	3	3	3
Power Plant Laboratory (EE 351, 352, 353)-----	1	1	1
Electives -----	3		3
	17 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$

* State and Local Government (Pol. Sc. 401) may be substituted.

	Junior Year	F	W	S
American History (Hist 41) -----		2		
Industrial Economics (Ec 313) -----				3
Electrical Measurements (EI 71) -----		3		
Electrical Measurements Laboratory (EI 74) -----		1		
Elementary Vacuum Tubes (EI 72) -----			3	
Elementary Vacuum Tubes Laboratory (EI 75) -----			1	
Industrial Controls (EI 73) -----				3
Industrial Controls Laboratory (EI 76) -----				1
Electrical Construction (EI 84, 85, 86) -----		2	2	2
Analytic Mechanics (ME 44) -----		3		
Strength of Materials (ME 45, 46) -----			3	3
Electives -----		7	8	6
		18	17	18

TWO-YEAR TECHNICAL CURRICULUM

The two-year technical curriculum in Electrical Industries consists of the first two years of the three-year technical curriculum.

DESCRIPTIONS OF COURSES IN ELECTRICAL ENGINEERING

EE 101 Elementary Theory of D. C. (3)

Three one-hour lectures; fall quarter; freshman year. Study of the nature of electricity and the laws which govern it as they apply to direct current circuits. Study of the nature of magnetism and the magnetic circuit.

EE 102 Direct Current Machinery (3)

Three one-hour lectures; winter quarter; freshman year. Construction, characteristics, and operation of direct current machinery.

EE 103 Elementary Theory of A. C. (3)

Three one-hour lectures; spring quarter; freshman year. Fundamentals of alternating current circuits and a general treatment of alternating current machinery.

EE 111 Introduction to Electrical Engineering (2)

Two one-hour lectures; fall quarter; freshman year. A preview of the engineering profession regarding its character and relation to social organization, also concerning the background of engineering.

EE 112 Electrical Safety Rules and Regulations (2)

Two one-hour lectures; winter quarter; freshman year. This course is designed to acquaint the student with the rules and regulations of the National Electric Code prepared by the National Board of Underwriters, the Electrical Safety Orders issued by the Division of Industrial Safety of the State of California, and the Rules for Overhead Line Construction published by the California Railroad Commission. Standard commercial practices in writing and installation of electrical equipment are introduced.

EE 141 Direct Current Circuit Laboratory (1)

One three-hour period; fall quarter, freshman year. Familiarization with laboratory layout and equipment. Study of direct current circuits.

EE 142 Direct Current Machinery Laboratory (1)

One three-hour period; winter quarter; freshman year. Study of the characteristics and operation of direct current machinery.

EE 143 Direct Current Machinery Laboratory (1)

One three-hour period; spring quarter; freshman year. A continuation of EE 142.

EE 163 Electricity for Printers (2)

Two one-hour lectures, spring quarter, freshman year. The uses of electrical equipment as applied to the printing trade. The definitions and basic principles of electricity provide concepts of voltage, current, and power. Repair and maintenance of electrical equipment used in the printing shop.

EE 201 Alternating Current Circuits (3)

Three one-hour lectures; fall quarter; sophomore year. Alternating current and voltage relations, alternating current circuits, complex quantities, alternating current instruments and measurements, and polyphase systems are offered in this course.

EE 202 Alternating Current Machinery (3)

Three one-hour lectures; winter quarter; sophomore year. A study of the construction, operation and regulation of the alternator, of the static transformer, and of the polyphase induction motor.

EE 203 Alternating Current Machinery (3)

Three one-hour lectures; spring quarter; sophomore year. Construction, operation and characteristics of the single phase induction motor, the synchronous converter, and synchronous motor, and briefs on the transmission of power.

EE 204 Electrical Equipment Maintenance (2)

Two one-hour lectures, fall quarter, sophomore year. The symptoms, causes, and remedies of troubles of electrical equipment. Methods used in carrying on programs of inspection, maintenance, and repair of electrical machinery.

EE 208, 209 Direct and Alternating Current Circuits (3) (3)

Three one-hour lectures, winter quarter, sophomore year. A course for mechanical, aeronautical, and air conditioning and refrigeration students. Principles of direct and alternating currents, electrical machinery, and control circuits are presented.

EE 223 General Codes and Wiring Practices (4)

Three one-hour lectures and one three-hour drafting laboratory, spring quarter, sophomore year. To give the architectural and mechanical engineering student a basic understanding and a working knowledge of electric code as it pertains to buildings. Electrical symbols, wire sizes and current capacities, line drop, conduit sizes, types of switches presented, as well as the introduction to direct and alternating current circuits. Laying out of electrical installations for buildings, giving detailed specifications.

EE 240 Additional Engineering Laboratory (1-2)

One or two three-hour laboratories, any quarter, sophomore year. Total credit limited to four units, with not more than two units in any one quarter.

EE 241 Alternating Current Laboratory (1)

One three-hour period, fall quarter, sophomore year. Alternating current circuits are set up in the laboratory, and measurements are made to determine the constants and variables and characteristics of the circuits.

EE 242 Alternating Current Machinery Laboratory (1)

One three-hour period, winter quarter, sophomore year. Standard electrical tests and experiments. Tests are run on the alternator, transformer, and the three-phase motor.

EE 243 Alternating Current Machinery Laboratory (1)

One three-hour period, spring quarter, sophomore year. Experiments are made on single-phase AC motors, the synchronous motor, and the synchronous converter to study the voltage, current, and power relations.

EE 245 General Electrical Laboratory (1)

One three-hour laboratory, winter quarter, sophomore year. The use of instruments for testing circuits, the types of controls and relays available, and the types and characteristics of motors and control circuits for motors. To be taken in conjunction with EE 208.

EE 254 Electrical Drafting (1)

One three-hour period, fall quarter, sophomore year. Study of drafting methods and principles as applied to electrical circuits. To gain proficiency in the tracing and simplification of circuit connection diagrams.

- EE 255 Electrical Drafting (1)**
One three-hour period, winter quarter, sophomore year. A continuation of EE 254.
- EE 256 Electrical Drafting (1)**
One three-hour period, spring quarter, sophomore year. A continuation of EE 255.
- EE 301 Electrical Measurements (3)**
Three one-hour lectures, fall quarter, junior year. Construction, operation and characteristics of electrical indicating instruments. The calibration of and tolerances of electrical measuring devices. Methods and practices used in making electrical tests and measurements.
- EE 302 Introduction to Electronics Industries (3)**
Three one-hour lectures, winter quarter, junior year. Electron emission, charges in electromagnetic fields, vacuum and gas filled tubes, rectifiers, amplifiers, oscillators, and simple circuits.
- EE 303 Industrial Electronics (3)**
Three one-hour lectures, spring quarter, junior year. The applications of electronic devices in industry, induction heating of metals and dielectrics, ignition control of electric welding, thyatron control, photo tube controls, as each are applied to industrial processes.
- EE 304 Power Transmission and Distribution (3)**
Three one-hour lectures, fall quarter, junior year. Mechanical and electrical features of distribution system engineering; transmission line design, economic and technical features; properties of cables and insulators.
- EE 305 Relay Engineering (3)**
Three one-hour lectures, winter quarter, junior year. Principles of relay operation, special emphasis on the use of the relay in automatic protection of electrical systems. Fundamentals of civil design.
- EE 306 Technical Problems and Reports (3)**
Three one-hour lectures, spring quarter, junior year. Technical problems are studied and solved. Similar problems are assigned for solution by the student.
- EE 311 Steam and Gas Engineering (3)**
Three one-hour lectures, fall quarter, junior year. The various kinds of power used in electrical generating plants, with emphasis on the internal combustion engine for small plants.
- EE 312 Steam and Gas Engineering (3)**
Three one-hour lectures, winter quarter, junior year. The economics of diesel-electric and gas-electric power generation in small power plants. The hydroelectric power system, the steam engine, the steam turbine, and the gas turbine.
- EE 313 Steam and Gas Engineering (3)**
Three one-hour lectures, spring quarter, junior year. The steam cycle and steam table, energy conversion, and heat transfer. Several kinds of steam systems and the auxiliaries in the steam power plant.
- EE 341 Electrical Measurements Laboratory (1)**
One three-hour period, fall quarter, junior year. Experiments are offered to supplement and prove the principles advanced in EE 301.
- EE 342 Vacuum Tube Laboratory (1)**
One three-hour period, winter quarter, junior year. Tests and measurements are made on the various types of electron tubes to verify their operational characteristics.
- EE 343 Industrial Electronics Laboratory (1)**
One three-hour period, spring quarter, junior year. Various types of industrial electronic equipment are set up for study and operation.

EE 351 Power Plant Operation Laboratory (1)

One three-hour laboratory period per week, fall quarter. This course is primarily arranged for electrical students taking the power plant operating course. The laboratory is held in the central heating plant in which there are diesel engines connected to electrical generators. In this laboratory the student will have experience in the operation of diesel engine power generating units, as well as some experience in testing and repair of these units.

EE 352 Power Plant Operation Laboratory (1)

One three-hour laboratory period per week, winter quarter. In this continuation of the previous course some work with steam will be introduced. The student is given experience in completing operating sheets and production costs.

EE 353 Power Plant Laboratory (1)

One three-hour laboratory period per week, spring quarter. This is a continuation of the previous course with more emphasis placed on steam.

EE 400 Special Problems for Advanced Undergraduates (1-2)

One or two three-hour laboratories, any quarter, senior year.

Total credit limited to four units, with not more than two units in any one quarter.

EE 401 Electrical Machine Design (3)

Three one-hour lectures, fall quarter, senior year. Principles, practice, and economic aspects of design, construction, and installation of electro-mechanical equipment.

EE 402 Telephone Engineering (3)

Three one-hour lectures, winter quarter, senior year. Telephone and telegraph transmission, characteristics of speech and hearing, amplifiers, electrical filters, equalizers, phase distortion correctors, delay circuits, impedance balancing circuits, and other electrical networks, and their coordination in communication circuits.

EE 403 Illumination Engineering (3)

Three one-hour lectures, spring quarter, senior year. An investigation of the illumination field, involving methods of measuring and controlling visible light and the principles of applying visible artificial light.

EE 404 Power System Stability (3)

Three one-hour lectures, fall quarter, senior year. Power system computations made on balanced and unbalanced conditions, including transients. Synchronous machine characteristics, network reduction, fault current computation, symmetrical components, switching, and system stability.

EE 441 Electrical Machine Design Laboratory (1)

One three-hour period, fall quarter, senior year. Mechanical electrical design problems are offered for complete layout and detail.

EE 442 Telephone Engineering Laboratory (1)

One three-hour period, winter quarter, senior year. Experiments illustrating the fundamental principles involved in the operation of communication circuits and electronic devices.

EE 443 Illumination Laboratory (1)

One three-hour period, spring quarter, senior year. The measurement of visible light sources, lighting fixtures, levels of illumination, reflection factors, transmission factors and various types of lighting installations.

EE 461, 462 Undergraduate Thesis (2) (2)

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

EE 463 Undergraduate Seminar**(2)**

One two-hour period, spring quarter, senior year. This course is designed to acquaint the student with special studies and the most recent technical developments in his field. Provision is made for student presentation of topics to be followed by a class panel discussion. Liberal use is made of the most recent publications.

DESCRIPTIONS OF TECHNICAL COURSES IN ELECTRICAL INDUSTRIES**EI 11 Direct Current Circuits****(3)**

Three one-hour lectures, fall quarter, freshman year. Study of nature of electricity, conductors, and nonconductors. Simple circuits, series and parallel. The meaning of current, voltage and resistance, relationships between these; Ohm's law; primary and secondary batteries. Study of magnetism and the magnetic circuit.

EI 12 Direct Current Machinery**(3)**

Three one-hour lectures, winter quarter, freshman year. Electromagnetism, magnetic induction, self and mutual. The magnetic circuit, Ohm's law for the magnetic circuit, study of electromagnetic apparatus. Study of the electric generators, shunt, series, and compound. Control and regulating equipment for generators and motors. Direct current armatures, and armature and field windings.

EI 13 AC Circuits and Machinery**(3)**

Three one-hour lectures, spring quarter, freshman year. Fundamentals of alternating current. Maximum, average, and effective values. The meaning of reactance and impedance. Counter e.m.f. Meaning of phase, lagging and leading currents, sine waves, power waves. Measurements of AC quantities, power factor, single and poly-phase currents, AC apparatus, transformers, generators, motors and control equipment and circuits.

EI 14 Direct Current Circuits Laboratory**(1)**

One three-hour period, fall quarter, freshman year. Laboratory experiments measuring voltage, currents, watts, simple DC networks and batteries, and resistance.

EI 15 Direct Current Machinery Laboratory**(1)**

One three-hour period, winter quarter, freshman year. Laboratory experiments on DC generators, compounded DC generators, series and shunt DC motors.

EI 16 AC Circuits and Machinery Laboratory**(1)**

One three-hour period, spring quarter, freshman year. Laboratory measurements of AC voltage, current, power, and impedance. Voltage and current transformers, single-phase motors.

EI 17 Electrical Construction Shop**(1)**

One three-hour laboratory, fall quarter, freshman year. Types of electrical supplies and equipment and their uses. Techniques for operating hand and power tools, and the method of using electrical supplies.

EI 18, 19 Electrical Construction Shop**(2) (2)**

Two three-hour laboratories, winter and spring quarters, freshman year. Experience in the practices of the electrical trades, including wiring for light and power, and repair of electrical apparatus.

EI 21 National Electric Code**(1)**

One-hour lecture, fall quarter, freshman year. A study of the National Electric Code prepared by the National Board of Fire Underwriters. The student becomes familiar with standard practice in electrical installations. Certain city electrical codes are studied in this course.

EI 22 Electrical Safety Orders**(1)**

One-hour lecture, winter quarter, freshman year. A continuation of the preceding course, but extending it to the study of the booklet of electrical safety orders in use in the State of California. The students follow this book in detail in order to become familiar with the safety requirements in commercial practice in wiring and installation of electrical equipment.

EI 23 Rules for Overhead Line Construction**(1)**

One-hour lecture, spring quarter, freshman year. A study of the standard rules for overhead line construction in use in the State of California. The book of rules published by the California Public Utilities Commission is used as the text.

EI 31 General Codes and Wiring Practices**(4)**

Three one-hour lectures and one three-hour drafting laboratory, fall quarter, sophomore year. To give the architectural and mechanical engineering student a basic understanding and a working knowledge of electric code as it pertains to buildings. Electrical symbols, wire sizes and current capacities, line drop, conduit sizes, types of switches and similar information is presented, as well as the introduction to direct and alternating current circuits. Laying out of electrical installations for buildings.

EI 32 Direct and Alternating Current Circuits**(3)**

Three one-hour lectures, winter quarter, sophomore year. Direct and alternating current circuits, alternators, single-phase and three-phase motors, and transformers.

EI 33 Control Circuits**(3)**

Three one-hour lectures, spring quarter, sophomore year. Electrical control circuits typical of those found in industrial installations.

EI 41 Alternating Current Circuits**(3)**

Three one-hour lectures, fall quarter, sophomore year. The course is designed to present the fundamental principles of alternating current circuits, series and parallel, resonant and nonresonant.

EI 42 Alternating Current Machinery**(3)**

Three one-hour lectures, winter quarter, sophomore year. Construction and operation of the polyphase alternator, voltage regulators, alternating regulation.

EI 43 Alternating Current Machinery**(3)**

Three one-hour lectures, spring quarter, sophomore year. The course is designed to give the student a basic understanding of the operation of the transformer, three-phase induction motors, synchronous motor, and the converter. The fundamentals of power distribution are introduced.

EI 44 Alternating Current Circuits Laboratory**(1)**

One three-hour laboratory, fall quarter, sophomore year. Alternating current circuits consisting of series and parallel combinations of resistance, inductance, and capacitance connected for study of the current, voltage, and power relations.

EI 45 Alternating Current Machinery Laboratory**(1)**

One three-hour laboratory, winter quarter, sophomore year. Complete tests and measurements on alternating current generators, transformers, auto transformers, and related equipment.

EI 46 Alternating Current Machinery Laboratory**(1)**

One three-hour laboratory, spring quarter, sophomore year. Alternating current motors of the three phase and single phase types, tested for their electrical characteristics. Relays, contactors, and other types of automatic controls.

EI 51, 52, 53 Electrical Construction Shop**(2) (2) (2)**

Two three-hour laboratories, sophomore year. Servicing of electrical equipment including motors, transformers, and related devices, and the installation of new electrical equipment or wiring as required on the campus.

EI 54, 55, 56 Electrical Drafting**(1) (1) (1)**

One three-hour laboratory, fall, winter, and spring quarters, sophomore year. Study of drafting methods and principles as applied to electrical circuits. Development of proficiency in the tracing and simplification of circuit connection diagrams.

EI 71 Electrical Measurements**(3)**

Three one-hour lectures, fall quarter, junior year. This course is designed to give a general treatment of the subject of electrical measurements and includes the study of the construction and application of the more common instruments which are employed by technicians in the field.

EI 72 Elementary Theory of Vacuum Tubes**(3)**

Three one-hour lectures, winter quarter, junior year. A continuation of EI 71 in which the study is extended to thermionic emissions, photoelectricity, thermionic vacuum tube theory, electrical conduction in gases, cold and hot cathode discharge devices.

EI 73 Industrial Controls**(3)**

Three one-hour lectures, spring quarter, junior year. This course is designed to present the application of electronics to industry. It includes a study of ignitrons, welding, and motor controls, and high-frequency heating.

EI 74 Electrical Measurements Laboratory**(1)**

One three-hour period, fall quarter, junior year. This is a laboratory course with appropriate experiments coordinated with and illustrating the lecture work of EI 71.

EI 75 Vacuum Tube Laboratory**(1)**

One three-hour period, winter quarter, junior year. Laboratory studies of various types of vacuum tubes such as diodes, triodes, pentodes, gaseous triodes, etc. First, their static characteristics are experimentally determined; then these characteristics are used to determine the operating properties of the various tubes as voltage amplifiers, detectors, oscillators, thyratron relays.

EI 76 Industrial Controls Laboratory**(1)**

One three-hour period, spring quarter, junior year. Laboratory studies of industrial control vacuum tube circuits. Vacuum tube voltage regulators, frequency stabilizers, gaseous triode control circuits, photoelectric circuits. Spot welding and high frequency induction and dielectric heating circuits.

EI 84 Electrical Construction Shop**(2)**

Two three-hour laboratories, fall quarter, junior year. Electrical construction work is planned, estimated, and installed. The student has opportunity to supervise electrical work and gain experience with fellow students on the job.

EI 85 Electrical Construction Shop**(2)**

Two three-hour periods, winter quarter, junior year. Continuation of EI 84.

EI 86 Electrical Construction Shop**(2)**

Two three-hour periods, spring quarter, junior year. Continuation of EI 85.

ELECTRONIC AND RADIO ENGINEERING DEPARTMENT

Department Head, CLARENCE RADIUS

GERALD B. PETERSON

HARRY K. WOLF

ELLIS RONEY

During the past three years the radio and electronic industries have grown to the position of a two and three-quarter billion dollar annual industrial activity in peace time. This phenomenal growth of a new industry has forced changes in technological education. The more progressive schools have found that the new field is entirely too broad to be incorporated into the traditional curriculum in Electrical Engineering. The prodigious growth of electronic devices in all industries and in the home has created an increasing number of problems resulting in an identifiable field of service trades.

The Institute of Radio Engineers (I. R. E.), the national professional engineering society in this field, has established an official Student Branch on the campus. Membership in this organization is restricted to those who are Student Members of the Institute of Radio Engineers. The I. R. E. Student Branch sponsors outside speakers, attends the West Coast I. R. E. Convention and the Electronic Manufacturers' Association Convention, and develops the student's ability to present and discuss technical topics before an audience.

The Amateur Radio Club operates the college amateur radio station W6BHZ. Membership in this organization is limited to FCC licensed radio amateurs.

California State Polytechnic College recognizes the existence of this new industrial field and the distinction in function and divergence in character between the engineering and technical phases of this new field of employment.

Two distinct curricula are offered. Both curricula have in common the California State Polytechnic College philosophy of practical training and concentration on usable knowledge to produce practical engineers and technicians. This objective is reflected in the type of courses offered, the subject matter of each course, the treatment of the subject, and the sequence of the subjects in the curricula. The college is also mindful of the many students who, because of problems other than scholastic, are compelled to leave school prior to completion of a prescribed curriculum. The needs of these students are met by making the curriculum terminal at a number of points. Should the student drop out at the end of the second year of the degree curriculum, he will have acquired sufficient technical education for employment in his chosen field and sufficient general education upon which he can build further formal or informal education.

Facilities

The electronic and radio laboratories occupy the entire second floor and basement of the former administration building. The space is divided into six laboratories, a model electronic service shop, a construction shop, an instrument stockroom, the amateur radio headquarters, and two department offices. The laboratories are equipped with special benches designed for radio work. Each operating position is equipped with variable DC and AC voltage supplies. There is an ample stock of DC and AC milliammeters, multimeters, electronic multimeters, electron tubes, tube checkers, variacs, precision variable inductors and capacitors, impedance bridges, etc. The special test equipment includes multiple units of audio oscillators, spare wave generators, distortion analyzers, calibrated attenuators, cathode ray oscilloscopes, vacuum tube voltmeters; radio frequency signal generators (both AM and FM), pulse generators, receiver analyzers, field strength meters, standard commercial AM and FM receivers and transmitters, Q-meters, radio frequency impedance bridge; micro-wave generators (both magnetron and klystron), micro-wave plumbing, and a micro-wave wattmeter, etc. The aeronautical radio laboratory and the experimental radar station W6XDM are located at the college landing field.

Degree Curriculum

The four-year curriculum in electronic and radio engineering leads to the Bachelor of Science degree. It provides training which includes a wide variety of applications in the fields of electronics and communications. Emphasis is placed on the "application" and "commercial" sides of engineering.

In the California State Polytechnic College system the major course work extends over a period of four years. There are a number of specific benefits resulting from this longer association with the major field of study. Employable skills of both a physical and analytical nature are developed at an early stage. A greater knowledge of and skill in the use of instruments is developed through increased use.

The first two years are devoted to a study of circuit components including electron tubes and elementary circuit analysis. The third year is devoted to the analysis and synthesis of circuits used in transmission and reception. In the fourth year the student has the choice of specializing in ultra high frequency techniques or industrial electronics.

The particularized treatment of subject matter is also reflected in the method used to treat the more specialized forms of mathematical analysis. Because more time is spent in the major subject, such topics as Fourier Series, Hyperbolic Functions, Bessel Functions, Vector Calculus, etc., can be taught as basic tools in the solution of practical engineering problems in the major field.

The laboratory work is treated as a series of graduated operations closely aligned to industrial practices, and not chiefly a matter of verification of known laws. This field lends itself to this type of treatment in a remarkable way. The very nature of the physical components and the character of instrumentation make possible a high degree of simulation of actual industrial setups in the college electronic and radio laboratories. This develops greater skill in handling actual problems and bridges the gap between "school" and "job."

Technical Curriculum

The technical curriculum is designed to meet the needs of the student desiring training which will prepare him for employment in the operating and maintenance activities of the radio and electronic industries and service trades, including aeronautical radio and industrial electronics. There is an increased emphasis in time and intensity in the technical curriculum on developing manual and related skills. All technical students are required to take special terminal courses in technical mathematics. The first year is devoted to the study of circuit components. The laboratory work of the first year is devoted to identification and characteristics of circuit components and their assembly in commercial units. In the second year the laboratory work is divided equally among test, repair, and construction. Those students who plan to seek employment as FCC Licensed Operators must spend sufficient time in the study of International Morse Code to acquire a speed of 20 words a minute. Ability to copy code on the typewriter is essential for those students desiring employment in aeronautical communications. The third year is devoted to special work in the fields of aeronautical radio and/or industrial electronics.

Two-year Technical Curriculum

A vocational certificate is awarded to the student who successfully completes the first two years of the technical curriculum.

Placement

The degree curriculum is designed to train men to fill many positions in industry, exclusive of those in pure research. Trained men are needed in such fields as application engineering, technical operations, construction, maintenance, and sales engineering by both manufacturing and operating companies in the fields of communications and electronics. The multiplicity of electronic devices in the home and small industry makes self-employment in service trades an attractive outlet.

The wide use of communication facilities by federal, state, and local government has opened many positions in this field. Many positions in civil service require a comprehensive education in communications or a closely related major.

The Armed Services offer attractive careers to men with college training in this field. Teaching is also a growing outlet.

The technical curriculum prepares men in the field of operations and maintenance in commercial sound and television broadcasting, police radio, aeronautical radio, etc. The tremendous post-war growth of communication facilities should encourage students to go into this phase of the work.

DEGREE CURRICULUM IN ELECTRONIC AND RADIO ENGINEERING

	Freshman Year	F	W	S
Physics (PSc 131, 132, 133) -----		4	4	4
Algebra (Math 107, 108) -----		3	3	
Analytic Geometry (Math 109) -----				3
Engineering Drafting (ME 121, 122, 123) -----		2	2	2
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----				2
Elementary Direct Current Theory (EL 101) -----		3		
Elementary Direct Current Laboratory (EL 141) -----		1		
Advanced Direct Current Theory (EL 102) -----			3	
Advanced Direct Current Laboratory (EL 142) -----			1	
Elementary Alternating Current Theory (EL 103) -----				3
Elementary Alternating Current Laboratory (EL 143) -----				1
A Survey of Radio (EL 111, 112, 113) -----		2	2	2
Electives -----		1	1	1
		<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$
	Sophomore Year			
English (Eng 104, 105, 106) -----		3	3	3
Calculus (Math 201, 202, 203) -----		3	3	3
Engineering Mechanics (PSc 201) -----		3		
Strength of Materials (ME 202, 203) -----			3	3
Physical Education (PE 241, 242, 243) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Advanced Alternating Current Circuits (EL 201, 202, 203) -----		3	3	3
Advanced Alternating Current Lab. (EL 241, 242, 243) -----		1	1	1
Electron Tubes (EL 211, 212, 213) -----		2	2	2
Electron Tube Laboratory (EL 251, 252, 253) -----		1	1	1
Electives -----		2	2	2
		<hr/> 18 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$
	Junior Year			
Chemistry (PSc 321, 322, 323) -----		4	4	4
Public Speaking (Eng 201) -----			2	
American Government (Pol Sci 301) -----		3		
Survey of United States History (Hist 304) -----			3	
Industrial Economics (Ec 313) -----				3
Elements of Acoustical Engineering (EL 311) -----		3		
Audio-Frequency Amplifications and Sound Circuits (EL 301) -----		3		
Audio-Frequency Measurements (EL 341) -----		1		
Radio-Frequency Amplification and Oscillation (EL 302) -----			3	
Radio-Frequency Measurements (EL 342) -----			1	
Modulation and Demodulation (EL 303) -----				3
Modulation and Demodulation Measurements (EL 343) -----				1
Radio Engineering Shop (EL 351, 352, 353) -----		1	1	1
Electives -----		2	3	5
		<hr/> 17	<hr/> 17	<hr/> 17

Senior Year			
	F	W	S
Industrial Management (Ec 411) -----	3		
Industrial Relations (Ec 412) -----		3	
* Background of Modern Affairs (Hist 305) -----			3
Family Psychology (Psy 403) -----			3
Undergraduate Thesis (EL 461, 462) -----	2	2	
Undergraduate Seminar (EL 463) -----			2
Transmission Lines (EL 401) -----	3		
Basic Pulse Circuits (EL 411) -----	3		
Antennas and Wave Propagation (EL 402) -----		3	
Television Engineering (EL 412) -----		3	
Principles of Radar (EL 403) -----			3
Industrial Electronics (EL 413) -----			3
Electronics Laboratory (EL 441, 442, 443) -----	2	2	2
Electives -----	5	5	2
	<hr/> 18	<hr/> 18	<hr/> 18

TECHNICAL CURRICULUM IN ELECTRONIC AND RADIO INDUSTRIES

Freshman Year			
	F	W	S
Physics (PSc 11, 12, 13) -----	3	3	3
Technical Mathematics (Math 11, 12, 13) -----	3	3	3
Engineering Drafting (ME 121, 122, 123) -----	2	2	2
Survey of Radio (EL 17, 18, 19) -----	2	2	2
Elementary Direct Current Theory (EL 11, 12) -----	3	3	
Elementary Alternating Current Theory (EL 13) -----			3
Elementary Direct Current Lab (EL 14) -----	2		
Advanced Direct Current Lab (EL 15) -----		1	
Elementary Alternating Current Lab (EL 16) -----			1
International Morse Code (EL 21, 22, 23) -----	2	2	2
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 17 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Sophomore Year			
English (Eng 11, 12, 13) -----	3	3	3
American Government (Pol Sci 42) -----		3	
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----			2
Theory of Radio Receivers (EL 41) -----	5		
Radio Receiver Servicing (EL 44) -----	2		
Theory of Public Address Systems (EL 42) -----		5	
Sound System Servicing (EL 45) -----		2	
Theory of Radio Transmitters (EL 43) -----			5
Radio Transmitter Servicing (EL 46) -----			2
Radio Construction Shop (EL 61, 62, 63) -----	2	2	2
International Morse Code (EL 51, 52, 53) -----	2	2	2
Elective -----	3	1	3
	<hr/> 17 $\frac{1}{2}$	<hr/> 18 $\frac{1}{2}$	<hr/> 19 $\frac{1}{2}$
Junior Year			
American History (Hist 41) -----	2		
Aeronautical Radio (EL 71) -----	3		
Television (EL 72) -----		3	
Industrial Electronics (EL 73) -----			3
Electronic and Radio Lab (EL 91, 92, 93) -----	2	2	2
Welding (ME 151, 152, 153) -----	1	1	1
Machine Shop (ME 141, 142, 143) -----	1	1	1
Electives -----	9	11	10
	<hr/> 18	<hr/> 18	<hr/> 17

* State and Local Government (Pol. Sc. 401) may be substituted.

TWO-YEAR TECHNICAL CURRICULUM

The two-year technical curriculum in Electronics and Radio Industries comprises the first two years of the three-year technical curriculum.

DESCRIPTIONS OF COURSES IN ELECTRONIC AND RADIO ENGINEERING**EL 101 Elementary Direct Current Theory (3)**

Three one-hour lectures, fall quarter, freshman year. Study of the nature of electricity, conductors and nonconductors. Ohm's law. Simple series and parallel circuits. Electrical power and energy. Measurement of resistance. Simple applications of Kirchoff's laws. Study of nature and characteristics of wet and dry batteries.

EL 102 Advanced Direct Current Theory (3)

Three one-hour lectures, winter quarter, freshman year. Study of magnets, magnetic fields, magnetic circuits. Electromagnetism, magnetic induction, self and mutual. Study of electric generators, shunt, series and compound. Study of motors and starting equipment. Motor-generator sets and dynamotors for portable receivers and transmitters. The electrostatic circuit, computation of elastance, electrostatic flux density, electric stresses in cables and insulators. Study of capacitance, inductance.

EL 103 Elementary Alternating Current Theory (3)

Three one-hour lectures, spring quarter, freshman year. Sine wave representation of currents and voltages. Maximum, average, and effective values. The meaning of reactance and impedance. Ohm's law for AC circuits. Phase angle, lagging and leading currents. Vector voltage diagrams. Introduction to complex notation. Resonance in series circuits, resonance in parallel circuits. Simple applications of Thevenin's theorem.

EL 111 Survey of Radio (2)

Two one-hour lectures, fall quarter, freshman year. Lectures and assigned readings in the history of radio. Study of the lives and contributions of leading scientists and inventors.

EL 112, 113 Survey of Radio (2) (2)

Two one-hour lectures, winter and spring quarters, freshman year. A rapid, descriptive survey of radio, introducing symbols and terminology to form a background for later analytical courses.

EL 141 Elementary Direct Current Laboratory (1)

One three-hour laboratory, fall quarter, freshman year. Simple series and parallel circuits. Measurement of current, voltage, and resistance. Detailed study of ammeters, voltmeters, and ohmmeters.

EL 142 Advanced Direct Current Laboratory (1)

One three-hour laboratory, winter quarter, freshman year. Detailed study of voltmeters, ammeters, and ohmmeters. Study of operational characteristics of motor, generators, and dynamotors used in radio equipment.

EL 143 Elementary Alternating Current Laboratory (1)

One three-hour laboratory, spring quarter, freshman year. Measurement of reactance and impedance at 60 cycle. Measurement of inductance and capacitance by volt-ammeter and fall of potential methods. Simple series and parallel circuits. Series and parallel resonance.

EL 201 Advanced Alternating Current Circuit Theory (3)

Three one-hour lectures, fall quarter, sophomore year. Study of the equations for instantaneous current, voltage, power. Vector algebra. Sinusoidal single-phase circuit analysis, series and parallel circuits. Resonance. Introduction to network theorems.

EL 202 Advanced Alternating Current Circuit Theory (3)

Three one-hour lectures, winter quarter, sophomore year. Study of coupled circuits. Transformer as an impedance matching device. Alternating current circuit measurements. Nonsinusoidal waveforms and Fourier series analysis.

EL 203 Advanced Alternating Current Circuit Theory**(3)**

Three one-hour lectures, spring quarter, sophomore year. Study of distributed parameters. Introduction to transmission lines at power, audio, and low radio frequencies. Hyperbolic and exponential solutions. Design, analysis and application of electric wave filters. Study of direct current transients through solution of elementary differential equations.

EL 211 Electron Tube Theory**(2)**

Two one-hour lectures, fall quarter, sophomore year. Review of atomic structure and the properties of the electron. Study of the control of electrons in electric and magnetic fields, electric and magnetic deflection and focusing. Study of electron emission, Richardson's and Dushman's equations, properties of thermionic emitters. Space charge and Child's law.

EL 212 Electron Tube Theory**(2)**

Two one-hour lectures, winter quarter, sophomore year. Analysis of the physical and electrical properties of diodes. Study of rectifier circuits, L and pi type filters, power supply regulation and impedance. Study of the triode as a four-terminal network, grounded-cathode, grounded-grid, grounded-plate configurations. Study of general purpose tetrodes, pentodes and beam power tube. Emphasis on graphical study of potential distribution curves and graphical characteristics of tubes.

EL 213 Electron Tube Theory**(2)**

Two one-hour lectures, spring quarter, sophomore year. Study of the effects of gas in thermionic and cold-cathode tubes. Gaseous diode rectifier circuits, ignitrons, voltage regulators. Study of thyratrons in amplitude and phase control circuits. Analysis of high vacuum and gas-filled photocells. Cathode ray tube. Special tubes used in television.

EL 240 Additional Engineering Laboratory**(1-2)**

One or two three-hour laboratories, any quarter, sophomore year. Total credit limited to four units, with not more than two units in any one quarter.

EL 241 Advanced Alternating Current Laboratory**(1)**

One three-hour period, fall quarter, sophomore year. Experimental study of the electrical properties of circuit elements over the audio-frequency range. Analysis of the properties of tuned circuits, series and parallel resonance over the audio-frequency range.

EL 242 Advanced Alternating Current Laboratory**(1)**

One three-hour period, winter quarter, sophomore year. Experimental determination of the properties of coils and condensers at radio frequencies. Study of commercial Q-Meters. Experimental verification of some of the useful network theorems.

EL 243 Advanced Alternating Current Laboratory**(1)**

One three-hour period, spring quarter, sophomore year. Analysis of some of the standard AC bridges, Wheatstone bridge with reactive arms, Wien bridge, Hay bridge, Maxwell bridge. Study of commercial impedance bridge.

EL 251 Electron Tube Laboratory**(1)**

One three-hour period, fall quarter, sophomore year. Study of thermionic emission from tungsten, thoriated tungsten, and oxide coated emitters. Determination of the constants in Richardson's equation. Analysis of the operating characteristics of high vacuum diodes. Study of rectifier circuits, impedance and regulation.

EL 252 Electron Tube Laboratory**(1)**

One three-hour period, winter quarter, sophomore year. Determination of the properties of multigrad high vacuum tubes. Graphical determination of tube characteristics from laboratory data. Commercial laboratory tests of tubes. Analysis of commercial tube checkers.

EL 253 Electron Tube Laboratory**(1)**

One three-hour period, spring quarter, sophomore year. Determination of the properties of gaseous rectifiers in power supplies. Operation of voltage regulators. Characteristics of thyratrons and four-element gas-filled tubes. Analysis of thyatron circuits using amplitude and phase control. Study of the cathode ray oscilloscope.

EL 301 Audio-frequency Amplification and Sound Circuits**(3)**

Three one-hour lectures, fall quarter, junior year. General analysis of voltage amplifier. Study of frequency, phase, harmonic, intermodulation and transient distortion. Sine and square-wave analysis. Feedback circuits. Power amplifiers, Class A, Class AB, Class B.

EL 302 Radio-frequency Amplification and Oscillation**(3)**

Three one-hour lectures, winter quarter, junior year. Study of Class C amplifiers, basic oscillator circuits. Crystal control. Radio-frequency coupling. Antenna coupling in receivers and transmitters. Frequency conversion.

EL 303 Modulation and Demodulation**(3)**

Three one-hour lectures, spring quarter, junior year. Study of the modulation processes and their mathematical analysis, AM, FM, and Pulse-time systems. Study of the process of demodulation, various types of detectors. Analysis of specific commercial circuits.

EL 311 Elements of Acoustical Engineering**(3)**

Three one-hour lectures, fall quarter, junior year. Physiological acoustics. Architectural acoustics, theory of reverberation, theory of sound absorption. Modern broadcast studio designs. Electrical analogues of mechanical and acoustical systems applied to microphones, pickup devices and loud speakers.

EL 341 Audio-frequency Measurements**(1)**

One three-hour period, fall quarter, junior year. Experimental determination of amplifier response characteristics. Distortion measurements. Current and voltage feedback circuit analysis. Measurement of power output and power sensitivity. Power distribution systems.

EL 342 Radio-frequency Measurements**(1)**

One three-hour period, winter quarter, junior year. Experimental determination of sensitivity and selectivity of tuned and untuned RF circuits. Characteristics of RF and IF transformers. Class C amplifiers. Basic oscillators. Measurement of driving power, power output, plate circuit efficient. Feeder systems.

EL 343 Modulation and Demodulation Measurements**(1)**

One three-hour period, spring quarter, junior year. Experimental study of grid and plate circuit systems of AM modulation. Direct frequency and phase modulation. Analysis of diode and triode AM detectors. Characteristics and adjustments of basic FM discriminators.

EL 351 Radio Engineering Shop**(1)**

One three-hour period, fall quarter, junior year. This course is run concurrently with the lecture and laboratory courses in audio-frequency engineering and deals with construction, operation, and testing of commercial audio equipment.

EL 352 Radio Engineering Shop**(1)**

One three-hour period, winter quarter, junior year. This course is run concurrently with the lecture and laboratory courses in radio-frequency engineering and deals with construction, operation, and testing of commercial radio frequency equipment.

EL 353 Radio Engineering Shop**(1)**

One three-hour period, spring quarter, junior year. This course is run concurrently with the lecture and laboratory courses in modulation and demodulation and deals with construction, operation, and testing of commercial modulators and detectors.

EL 400 Special Problems for Advanced Undergraduates**(1-2)**

One or two three-hour laboratories, any quarter, senior year. Total credit limited to four units, with not more than two units in any one quarter.

EL 401 Transmission Lines**(3)**

Three one-hour lectures, fall quarter, senior year. Study of radio-frequency lines. Lines as circuits elements. Stub matching and UHF measurements with Smith charts. Applications to FM and TV.

EL 402 Antennas and Wave Propagation**(3)**

Three one-hour lectures, winter quarter, senior year. Introduction to Vector calculus. Solution of Maxwell's equation. Radiation. Spherical and plane electromagnetic waves. Wave guide, cavity resonator, and horns. Antenna arrays.

EL 403 Principles of Radar**(3)**

Three one-hour lectures, spring quarter, senior year. Introduction to radar concepts. UHF oscillator circuits, magnetron, klystron, and lighthouse. Rieke diagram. T-R switches. Radar receivers.

EL 411 Basic Pulse Circuits**(3)**

Three one-hour lectures, fall quarter, senior year. Study of relaxation oscillators, shaping and timing circuits. Pulse transformers. Sweep circuits. Wideband video, IF and RF amplifiers. In general, circuits common to TV and Radar systems.

EL 412 Television Engineering**(3)**

Three one-hour lectures, winter quarter, senior year. General analysis of FCC-RMA standard television signal. Principles of scanning. Television camera tube, iconoscope, image-orthicon. Synchronizing generators. Television transmitters. Analysis of picture channel of television receiver.

EL 413 Industrial Electronics**(3)**

Three one-hour lectures, spring quarter, senior year. Study of electronic control circuits used to time operations. Photo electric control. Thyatron-ignitron circuits in resistance welding. Radio frequency heating. Introduction to servo-mechanisms.

EL 441 Electronic Engineering Laboratory**(2)**

Two three-hour periods, fall quarter, senior year. Half time on standard experiments with transmission lines, half time on adjustments and operation of radar equipment.

EL 442 Electronic Engineering Laboratory**(2)**

Two three-hour periods, winter quarter, senior year. Radio majors continue with projects started in EL 441. Electronic majors work on projects dealing with photocells and control circuits, gaseous tubes and associated control circuits. Radio-frequency heating equipment.

EL 443 Electronic Engineering Laboratory**(2)**

Two three-hour periods, spring quarter, senior year. Continuation of projects started in EL 442.

EL 461, 462 Undergraduate Thesis**(2) (2)**

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

EL 463 Undergraduate Seminar**(2)**

Two one-hour meetings, spring quarter, senior year. Discussion of new developments in the fields of communications and industrial electronics, with particular reference to fields of employment. Job analysis.

DESCRIPTIONS OF TECHNICAL COURSES IN ELECTRONIC AND RADIO INDUSTRIES

EL 11 Elementary Direct Current Theory**(3)**

Three one-hour lectures, fall quarter, freshman year. Study of the history and methods of communications. Ohm's law. Power and energy. Types and effects of electric current. Basic theory of electricity. Magnetism, characteristics and construction of wet and dry batteries. Simple series, parallel, series-parallel circuits.

EL 12 Advanced Direct Current Theory (3)

Three one-hour lectures, winter quarter, freshman year. Study of construction and types of meters. Study of electric generators, motors and starting equipment. Study of the laws of inductance. Study of capacitors, their construction, use and method of connection in simple circuits. Study of transformers, radio, audio, power.

EL 13 Elementary Alternating Current Theory (3)

Three one-hour lectures, spring quarter, freshman year. Circuit characteristics of an alternating current circuit. Effect of inductive and capacitive reactance. The study of simple and complex circuits. The study of resonance. Study of series, parallel, and series-parallel resonant circuits. The study of basic radio circuits. The study of filter action. The study of coupled circuits. The study of band-pass amplifier circuits. The study of vacuum tube characteristics.

EL 14 Elementary Direct Current Laboratory (2)

Two three-hour periods, fall quarter, freshman year. Simple series, parallel, series-parallel circuits. Measurement of current voltage, resistance. Identification and methods of measuring resistors. Plot of magnetic fields of bar magnets and solenoids.

EL 15 Advanced Direct Current Laboratory (1)

One three-hour period, winter quarter, freshman year. Detailed study of ammeters, voltmeters, ohmmeters, and multimeters. Motors and generators and dynamos. Self and mutual induction. Capacitance.

EL 16 Elementary Alternating Current Laboratory (1)

One three-hour period, spring quarter, freshman year. Measurement of reactance at 60 cycles. Simple series, parallel and series-parallel 60-cycle circuits. Series resonance and parallel resonance at 60 cycles. Simple basic radio circuits. Characteristic curves of vacuum tubes.

EL 17 Survey of Radio (2)

Two one-hour lectures, fall quarter, freshman year. Lectures and assigned readings in the history of radio. Study of the lives and contributions of leading scientists and inventors.

EL 18, 19 Survey of Radio (2) (2)

Two one-hour lectures, winter and spring quarters, freshman year. A rapid, descriptive survey of radio, introducing symbols and terminology to form a background for later analytical courses.

EL 21, 22, 23 International Morse Code (2) (2) (2)**EL 51, 52, 53 (2) (2) (2)**

Six hours per week each quarter of freshman and sophomore years. Practice in the transmission and reception of International Morse Code signals. Copying of the received signals on the typewriter. Transmission practice with the semiautomatic key. Practice in handling network traffic.

EL 41 Theory of Radio Receivers (5)

Five one-hour lectures, fall quarter, sophomore year. This course treats commercial AM and FM receivers from the antenna through the detector stage, dealing with RF amplification, frequency conversion, IF amplification, AM detectors, FM discriminators, AVC systems, etc.

EL 42 Theory of Public Address Systems (5)

Five one-hour lectures, winter quarter, sophomore year. This course treats Class A voltage amplifiers, and Class A, Class AB, Class B power amplifiers as used in radio receivers, sound systems, and modulators. Study of microphones, pickups, loudspeakers, and sound system installations.

EL 43 Theory of Radio Transmitters (5)

Five one-hour lectures, spring quarter, sophomore year. Study of basic types of oscillators, frequency control, intermediate and final power amplifiers. Analysis of systems of modulation. Antenna systems.

EL 44 Radio Receiver Servicing**(2)**

Two three-hour periods, fall quarter, sophomore year. Testing and servicing of standard commercial receivers.

EL 45 Sound System Servicing**(2)**

Two three-hour periods, winter quarter, sophomore year. Testing and servicing of standard commercial sound equipment.

EL 46 Radio Transmitter Servicing**(2)**

Two three-hour periods, spring quarter, sophomore year. Testing and servicing of standard commercial CW and phone transmitters.

EL 61 Radio Construction Shop**(2)**

Two three-hour periods, fall quarter, sophomore year. This course is taken concurrently with Theory of Radio Receivers and Radio Receiver Servicing and deals with the problems related to the production of commercial receivers.

EL 62 Radio Construction Shop**(2)**

Two three-hour periods, winter quarter, sophomore year. This course is taken concurrently with Theory of Public Address Systems and Sound System Servicing and deals with problems related to the manufacture of sound equipment.

EL 63 Radio Construction Shop**(2)**

Two three-hour periods, spring quarter, sophomore year. This course is taken concurrently with Theory of Radio Transmitters and Radio Transmitter Servicing and deals with problems related to the manufacture of transmitting equipment.

EL 71 Aeronautical Radio**(3)**

Three one-hour lectures, fall quarter, junior year. Study of radio for aviation and communication, direction finders, radio range, absolute altimeters, GCA, ILS, and two-way high frequency communication systems.

EL 72 Television**(3)**

Three one-hour lectures, winter quarter, junior year. Study of the FCC-RMA standard television signal. Operating principles of television systems, camera tubes, video amplifiers, sync generators and transmitters. Detailed study of the television receiver.

EL 73 Industrial Electronics**(3)**

Three one-hour lectures, spring quarter, junior year. Study of industrial electronic control circuits used in resistance welding, photoelectric devices, motor speed regulators, etc. Study of induction and dielectric heating.

EL 91 Electronic and Radio Laboratory**(2)**

Two three-hour periods, fall quarter, junior year. Students will be assigned to projects covering a wide range of topics including aeronautical radio, television, and industrial electronics.

EL 92 Electronic and Radio Laboratory**(2)**

Two three-hour periods; winter quarter; junior year. Continuation of EL 91.

EL 93 Electronic and Radio Laboratory**(2)**

Two three-hour periods; spring quarter; junior year. Continuation of EL 92.

MAINTENANCE ENGINEERING DEPARTMENT

Department Head, THOMAS HARDGROVE

ROBERT H. REECE

I. G. VAN NEST

The objective of this curriculum is to train men in various phases of building construction and the maintenance of buildings and equipment of industrial plants or institutions. This course gives the student practical experience, as well as theoretical training, in the engineering and construction work necessary to carry on the maintenance and expansion of an institution or industrial plant. Laboratory work provides the student with experience in carpentry work, cabinet making, painting, electrical work, machine shop, welding, concrete work, plastering, surveying, mapping, plumbing, heating, ventilating, and refrigeration.

Facilities

The campus as a whole is the laboratory for the Maintenance Engineering Department, and the students will conduct maintenance work on the campus for much of their laboratory work. The instructors are skilled workmen in these maintenance fields. A well-equipped general repair shop is available as a laboratory for the woodworking courses. This building, with approximately 2,000 square feet of floor area, is equipped with standard woodworking tools, such as planers, joiners, and sanders. Painting work will be done from the established paint shop which is operated for general maintenance on the campus.

Degree Curriculum

The purpose of the four-year curriculum, which leads to the Bachelor of Science degree, is to train men in the maintenance and operation of the physical properties of an institution, school, or large industrial plant. Enough technical background is given so that the student will have the fundamentals of all engineering necessary to carry on supervision of maintenance work in any type of institution. He also obtains practical knowledge and experience in dealing with on-the-job personnel problems. Maintenance engineering students take their thesis and seminar work under the Department of Mechanical Engineering.

Technical Curriculum

The three-year curriculum is designed for a student whose time is limited or who is less interested in the more advanced work in maintenance engineering. On completion of the three-year curriculum the student is well qualified to work under supervision on maintenance of buildings and grounds for an institution. A technical certificate is awarded to the student who satisfactorily completes the three-year curriculum.

Two-year Technical Curriculum

This curriculum is designed for the student who is interested in general maintenance work but who has a limited time for schooling. He obtains a knowledge of electrical work, plumbing, painting, and carpentry, and is qualified as a workman in these fields. A vocational certificate is awarded to the student who satisfactorily terminates his work at the end of the second year of the technical curriculum.

Placement

Responsible positions in the supervision of the maintenance of buildings, grounds, and equipment for large industrial plants, schools, or state institutions are open to degree graduates in this curriculum. A student who successfully completes the three-year or two-year curriculum will find employment opportunities in small institutions or plants where he can do much of the maintenance work himself. If his employment is with a large institution or plant, he may enter as a workman but will have the background to advance into a supervisory position.

DEGREE CURRICULUM IN MAINTENANCE ENGINEERING

	Freshman Year	F	W	S
Physics (PSc 131, 132, 133) -----		4	4	4
Mathematics (Math 107, 108, 109) -----		3	3	3
Engineering Drafting (ME 121, 122, 123) -----		2	2	2
Carpentry (M 121, 122, 123) -----		4	4	4
Painting (M 124, 125, 126) -----		4	4	4
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----				2
		17 $\frac{1}{2}$	17 $\frac{1}{2}$	19 $\frac{1}{2}$
	Sophomore Year			
English (Eng 104, 105, 106) -----		3	3	3
Mathematics (Math 201, 202, 203) -----		3	3	3
Plumbing Maintenance (M 221, 222, 223) -----		2	2	2
Direct and Alternating Current Circuits (EE 223, 208, 209) -----		4	3	3
Electrical Maintenance (M 224, 225, 226) -----		3	3	3
Machine Shop (ME 141, 142, 143) -----		1	1	1
Welding (ME 151, 152, 153) -----		1	1	1
Physical Education (PE 241, 242, 243) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Electives -----			1	1
		17 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$
	Junior Year			
Engineering Mechanics (PSc 201) -----		3		
Public Speaking (Eng 201) -----			2	
Chemistry (PSc 321, 322, 323) -----		4	4	4
Survey of United States History (Hist 304) -----		3		
American Government (Pol Sc 301) -----			3	
Industrial Economics (Ec 313) -----				3
Masonry (M 321, 322, 323) -----		3	3	3
Strength of Materials (ME 202, 203) -----			3	3
Electives -----		5	3	5
		18	18	18
	Senior Year			
Industrial Management (Ec 411) -----		3		
Surveying (ME 431, 432, 433) -----		2	2	2
Mapping (M 421, 422, 423) -----		2	2	2
Construction Cost Estimating (M 441, 442, 443) -----		2	2	2
Sanitary Engineering (M 411, 412, 413) -----		3	3	3
Industrial Relations (Ec 412) -----			3	
Background of Modern Affairs (Hist 305) -----				3
Family Psychology (Psy 403) -----				3
Thesis (ME 461, 462) -----		2	2	
Seminar (ME 463) -----				2
Electives -----		3	3	
		17	17	17

TECHNICAL CURRICULUM IN MAINTENANCE INDUSTRIES

	Freshman Year			
Physics (PSc 11, 12, 13) -----		3	3	3
Mathematics (Math 11, 12, 13) -----		3	3	3
Engineering Drafting (ME 121, 122, 123) -----		2	2	2
Carpentry (M 20, 21, 22) -----		4	4	4
Painting (M 23, 24, 25) -----		4	4	4
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----				2
Electives -----		1	1	
		17 $\frac{1}{2}$	17 $\frac{1}{2}$	18 $\frac{1}{2}$

Sophomore Year			
	F	W	S
English (Eng 11, 12, 13)-----	3	3	3
American Government (Pol Sc 42)-----		3	
Plumbing Maintenance (M 40, 41, 42)-----	2	2	2
General Codes and Wiring Practices (EI 31)-----	4		
DC and AC Circuits (EI 32)-----		3	
Control Circuits (EI 33)-----			3
Electrical Maintenance (M 43, 44, 45)-----	3	3	3
Machine Shop (ME 141, 142, 143)-----	1	1	1
Welding (ME 151, 152, 153)-----	1	1	1
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Electives-----	3	1	4
	17 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$
Junior Year			
American History (Hist 41)-----	2		
Analytic Mechanics (ME 44)-----	3		
Strength of Materials (ME 45, 46)-----		3	3
Machine Shop (ME 241, 242, 243)-----	1	1	1
Welding (ME 251, 252, 253)-----	1	1	1
Masonry (M 71, 72, 73)-----	3	3	3
Electives-----	8	10	9
	18	18	17

TWO-YEAR TECHNICAL CURRICULUM

The two-year technical curriculum in Maintenance Industries comprises the first two years of the three-year technical curriculum.

DESCRIPTIONS OF COURSES IN MAINTENANCE ENGINEERING

M 121, 122, 123 Carpentry (4) (4) (4)

Two one-hour lectures, two three-hour laboratories; fall, winter and spring quarters; freshman year. Fundamentals of carpentry in connection with small building construction; plan reading and specifications for large buildings. Repair work, cabinet work, and construction of small buildings included in laboratory periods.

M 124, 125, 126 Painting (4) (4) (4)

Two one-hour lectures, two three-hour laboratories; fall, winter and spring quarters; freshman year. Technical work connected with painting and the application of paints, with special emphasis given to the repairing and decorating of buildings and interiors. Laboratory work includes maintenance jobs on the campus. The student obtains a cross-section of experiences in institutional maintenance. Emphasis given to costs and quality of materials and workmanship.

M 221, 222, 223 Plumbing Maintenance (2) (2) (2)

One hour lecture, one three-hour laboratory, fall, winter, and spring quarters, sophomore year. Plumbing codes and fundamentals dealing with maintenance of plumbing and piping systems in an industrial plant or an institution. Laboratory work includes campus maintenance work.

M 224, 225, 226 Electrical Maintenance (3) (3) (3)

One hour lecture and two three-hour laboratories, fall, winter, and spring quarters, sophomore year. Study of fundamentals of safety rules, the National Electric Code, maintenance methods for electrical equipment and lines. Emphasis given to the keeping of maintenance records on equipment and inspections. The laboratory includes maintenance of the campus electrical equipment, power generating plant and electrical distribution system.

M 321, 322, 323 Masonry (3) (3) (3)

Two one-hour lectures, one three-hour laboratory, fall, winter, and spring quarters, junior year. Fundamentals of construction with brick, stone, concrete, and plaster, with emphasis on repair and maintenance or small installations of concrete work. Laboratory work includes on-campus maintenance jobs selected for their training value.

M 326 Custodial Management**(2)**

One hour lecture and one three-hour laboratory, spring quarter, junior year. Equipment and methods used in building cleaning and sanitation. Emphasis placed on treatment and care of various types of floors.

M 332, 333 Boiler Maintenance**(2) (2)**

One hour lecture, and one three-hour laboratory, winter and spring quarters, senior year. Fundamentals of boiler construction and operation, high and low pressures, fire and water tube units, steam generators, codes, fuels, and accessories.

M 421, 422, 423 Mapping**(2) (2) (2)**

One hour lecture, one three-hour laboratory, fall, winter, spring quarters, senior year. Given in conjunction with the surveying course, with emphasis placed on the maps necessary for maintenance of industrial plant or institution. Electrical wiring diagrams, underground water, gas, sewer, and electrical systems, and the records and methods necessary for keeping institution maps up to date. Maintenance of drawing files and methods of keeping building drawings up to date when alterations are made.

M 441, 442, 443 Construction Cost Estimating**(2) (2) (2)**

Two one-hour laboratories, fall, winter, and spring quarters, senior year. Fundamentals of quantity surveying checking and estimating amount of materials taken from drawing, making lists of materials for construction work, and a study of the method of estimating costs on construction work. The work is conducted largely in the drafting room, using drawings of buildings which have been constructed or planned for future construction on the campus.

M 411, 412, 413 Sanitary Engineering**(3) (3) (3)**

Three one-hour lectures, fall, winter, and spring quarters, senior year. Fundamentals of sewage disposal plants operation and the treatment of industrial wastes before disposal into sewer systems. Study of plumbing codes and requirements for the maintenance of sanitary conditions.

DESCRIPTIONS OF TECHNICAL COURSES IN MAINTENANCE INDUSTRIES**M 20, 21, 22 Carpentry****(4) (4) (4)**

Two one-hour lectures, two three-hour laboratories, fall, winter, and spring quarters, freshman year. Fundamentals of carpentry with emphasis on small building construction and methods of repair and remodeling in buildings. Experience in estimating of materials. The laboratory includes general repair work, cabinet work, construction of small buildings and repairs to buildings on the campus.

M 23, 24, 25 Painting**(4) (4) (4)**

Two one-hour lectures, two three-hour laboratories, fall, winter, and spring quarters, freshman year. Techniques of painting and the application of paint to various types of surfaces. Laboratory work includes actual painting jobs on various buildings.

M 40, 41, 42 Plumbing Maintenance**(2) (2) (2)**

One one-hour lecture, one three-hour laboratory, fall, winter, and spring quarters, sophomore year. Study of plumbing codes, fundamentals of maintenance of plumbing and piping systems for industrial plants. Repair and maintenance of campus plumbing system part of laboratory work.

M 71, 72, 73 Masonry**(3) (3) (3)**

Two one-hour lectures, one three-hour laboratory, fall, winter, and spring quarters, junior year. Fundamentals of construction using concrete, brick, stone, or plaster, with emphasis on repair and maintenance work or small installations of concrete. The laboratory work consists of campus repair jobs, selected for their training value.

MECHANICAL ENGINEERING DEPARTMENT

Department Head, T. J. ZILKA

CLIFFORD ANDERSON
HENRY P. CLAYGERALD E. ELLIS
HUGH W. HAROLDSON
JOY O. RICHARDSONROBERT M. JOHNSTON
ROBERT H. REECE

The objective of the Mechanical Engineering Department is to give the student practical instruction in the operation, maintenance, product development, production, and sales branches of mechanical engineering. The student is given basic instruction in design so that he is qualified to work in the drafting room as well as in the operating plant. It is not the main purpose of this curriculum to prepare research engineers.

Facilities

The main laboratory for the Mechanical Engineering Department is in the central heating plant and power plant. This building is equipped with steam boilers, steam engines connected to electric generators, Diesel electric generating units and several Diesel engines for laboratory test work, as well as laboratory test equipment. The student has an opportunity to work with the electric generating units as power plant operator and to perform power and efficiency tests. Much of the maintenance work on the equipment is done by the students.

Degree Curriculum

The four-year curriculum leading to a Bachelor of Science degree in mechanical engineering is organized to give the student a broad foundation in the various phases of mechanical engineering. Laboratory and lecture work in power plants and power plant operation cover both steam and internal combustion engines. Courses in machine design, strength of materials, and fluid mechanics are required of all mechanical engineering students, as well as a general course in electrical engineering and engineering surveying. Students have the option in this department of specializing in the senior year.

Technical Curriculum

The purpose of this curriculum is to train students in the maintenance and operation fields of mechanical industries. Students who complete the three-year technical curriculum are well qualified to enter operation and maintenance in steam power plants or the handling of internal combustion engines or any heavy power equipment. The training is broad enough to give the student a general background of experience with mechanical equipment.

Two-year Technical Curriculum

Completion of this curriculum provides a student with a cross section of information about internal combustion engines and steam power plants, as well as the drafting room procedure for the heating and ventilating systems. The student will be prepared either for power plant operating jobs or work in the layout of plumbing, heating and ventilating systems as a draftsman. A vocational certificate will be awarded to a student who successfully completes the first two years of the technical curriculum.

Placement

The mechanical engineering curricula prepare students primarily for placement in maintenance, operation, product development, production, and sales engineering, rather than for research positions. A student who has completed the degree curriculum is well qualified for employment in large steam electric generating plants and will have the basic technical information required in the supervision of such a plant after he has obtained the practical experience on the job. There are also placement opportunities in the maintenance as well as production engineering departments of manufacturing companies, and in transportation and petroleum work. Mechanical engineers also work in the building construction industry in the layout of heating, ventilating, and plumbing systems for large buildings.

DEGREE CURRICULUM IN MECHANICAL ENGINEERING

	Freshman Year	F	W	S
Physics (PSc 131, 132, 133)-----		4	4	4
Algebra (Math 107, 108)-----		3	3	
Analytic Geometry (Math 109)-----				3
Engineering Drafting (ME 121, 122, 123)-----		2	2	2
Physical Education (PE 141, 142, 143)-----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----				2
Internal Combustion Engines (ME 101)-----		3		
Steam Power Plants (ME 102, 103)-----			3	3
Mechanical Engineering Lab (ME 144, 145, 146)-----		2	2	2
Machine Shop (ME 141, 142, 143)-----		1	1	1
Welding (ME 151, 152, 153)-----		1	1	1
Electives-----		2	2	
		18 $\frac{1}{2}$	18 $\frac{1}{2}$	18 $\frac{1}{2}$
	Sophomore Year			
English (Eng 104, 105, 106)-----		3	3	3
Calculus (Math 201, 202, 203)-----		3	3	3
Physical Education (PE 241, 242, 243)-----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Heating and Ventilating (AC 204)-----			3	
Heating and Ventilating Lab (AC 241)-----			2	
Engineering Mechanics (PSc 201)-----		3		
Dynamics (ME 205)-----			3	
Kinematics (ME 223)-----				3
General Codes and Wiring Practices (EE 223)-----		4		
DC and AC Circuits (EE 208, 209)-----			3	3
Electrical Lab (EE 245)-----			1	
Plumbing and Building Sanitation (ME 331)-----				4
Electives-----		3		
		16 $\frac{1}{2}$	18 $\frac{1}{2}$	16 $\frac{1}{2}$
	Junior Year			
General Chemistry (PSc 321, 322, 323)-----		4	4	4
Public Speaking (Eng 201)-----		2		
American Government (Pol Sc 301)-----			3	
Survey of U. S. History (Hist 304)-----				3
Industrial Economics (Ec 313)-----				3
Strength of Materials (ME 202, 203)-----		3	3	
Introduction to Machine Design (ME 323)-----				3
Fluid Flow (ME 311, 312)-----		3	3	
Thermodynamics (ME 401, 402, 403)-----		3	3	3
Strength of Materials Lab (ME 249)-----				1
Fluid Flow Lab (ME 345)-----			1	
Electives-----		3		
		18	17	17
	Senior Year			
Industrial Relations (Ec 412)-----			3	
Industrial Management (Ec 411)-----		3		
* Background of Modern Affairs (Hist 305)-----				3
Family Psychology (Psy 403)-----				3
Undergraduate Thesis (ME 461, 462)-----		2	2	
Undergraduate Seminar (ME 463)-----				2
† Engineering Surveying (ME 431, 432, 433)-----		2	2	2
‡ Machine Design (ME 421, 422, 423)-----		5	5	5
Electives-----		5	6	3
		17	18	18

* State and Local Government (Pol Sc 401) may be substituted.

† Two units of degree engineering courses may be substituted for ME 433—Surveying, subject to the approval of the department head.

‡ Fifteen units chosen from any one of the following may be substituted for Machine Design (ME 421, 422, 423): Mechanical Equipment of Buildings (ME 424, 425, 426) or Manufacturing Processes (ME 427, 428, 429) or Welding Design (ME 434, 435, 436).

TECHNICAL CURRICULUM IN MECHANICAL INDUSTRIES

Freshman Year	F	W	S
Mathematics (Math 11, 12, 13) -----	3	3	3
Physics (PSc 11, 12, 13) -----	3	3	3
Engineering Drafting (ME 121, 122, 123) -----	2	2	2
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----			2
Machine Shop (ME 141, 142, 143) -----	1	1	1
Welding (ME 151, 152, 153) -----	1	1	1
Mechanical Engineering Lab (ME 41, 42, 43) -----	2	2	2
Power Plant Operation (ME 51, 52, 53) -----	3	3	3
Electives -----	2	2	
	<u>17$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>
Sophomore Year			
Technical English (Eng 11, 12, 13) -----	3	3	3
American Government (Pol Sc 42) -----		3	
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Analytic Mechanics (ME 44) -----	3		
Strength of Materials (ME 45, 46) -----		3	3
Strength of Materials Lab (ME 249) -----			1
Heating and Ventilating (AC 47) -----	3		
Heating and Ventilating Layout (AC 44) -----	2		
Plumbing and Building Sanitation (ME 55) -----		4	
General Codes and Wiring Practices (EI 31) -----			4
Machine Shop (ME 241, 242, 243) -----	1	1	1
Welding (ME 154, 155, 156) -----	1	1	1
Electives -----	5	2	4
	<u>18$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>
Junior Year			
American History (Hist 41) -----	2		
Industrial Economics (Ec 313) -----			3
Chemistry (PSc 4) -----	3		
Welding (ME 251, 252, 253) -----	1	1	1
Family Psychology (Psy 403) -----	3		
DC & AC Circuits (EI 32, 33) -----		3	3
Electives -----	9	14	10
	<u>18</u>	<u>18</u>	<u>17</u>

TWO-YEAR TECHNICAL CURRICULUM

The two-year technical curriculum in Mechanical Industries consists of the first two years of the three-year technical curriculum.

DESCRIPTIONS OF COURSES IN MECHANICAL ENGINEERING**ME 101 Internal Combustion Engines (3)**

Three one-hour lectures, fall quarter, freshman year. Study of diesel and gas engine operation, maintenance and repair; internal combustion engines for small power plants. An introduction to internal combustion engines for all mechanical engineering students.

ME 102 Steam Power Plants (3)

Three one-hour lectures, winter quarter, freshman year. An introduction to steam power plant operation. Study is made of various equipment used in steam power plants. Emphasis placed upon maintenance of equipment and operation of steam electric generating plants.

ME 103 Steam Power Plants**(3)**

Three one-hour lectures, spring quarter, freshman year. Continuation of ME 102 with attention given to steam tables in the calculation of problems; the modern steam electric generating plant with special consideration given to various cycles of operation which are experimental at the present time.

ME 121 Engineering Drafting**(2)**

One-hour lecture and one three-hour laboratory, fall quarter, freshman year. A study and practice in the use of drafting instruments, lettering, geometric construction, orthographic and pictorial projections, and dimensioning. Standard practices are emphasized with their application to the requirements of industry.

ME 122 Engineering Drafting**(2)**

One-hour lecture and one three-hour laboratory, winter quarter, freshman year. Single and double auxiliary projection, types and principles of working drawings, sections and conventional representation, gears and cams, and generation of surfaces, including parallel line developments, radial line developments and triangulation.

ME 123 Engineering Drafting**(2)**

One-hour lecture and one three-hour laboratory, spring quarter, freshman year. Intersections and developments, threads and fastenings, piping drawings, welding symbols, detail and assembly drawings and sketching. In laboratory, good pencil technique is stressed as a requisite for drawings from which reproductions are made.

ME 125 Descriptive Geometry**(3)**

One one-hour lecture, two three-hour laboratories, winter quarter. Study of space relations of points, lines, and plane surfaces and their application to the graphic solution of space problems.

Prerequisite: ME 121

ME 126 Descriptive Geometry**(3)**

One one-hour lecture, two three-hour laboratories, spring quarter. The construction of space curves and the determination of shades and shadows.

Prerequisite: ME 125

ME 144 Mechanical Engineering Laboratory**(2)**

Two three-hour laboratories, fall quarter, freshman year. The laboratory work deals with internal combustion engines and experiments on engines in the electric generating plant. The course consists of two types of work—typical laboratory experiments, and repair and overhaul work on internal combustion engines. The work is equally divided between the overhaul and repair and experiments such as taking indicator cards on diesel engines, running efficiency tests on engines, checking heat value of fuels, and other laboratory experiments. The overhaul and repair work on the engines consists of such jobs as pulling cylinder heads, grinding valves, replacing piston rings, fitting connecting rod bearings, and general repair work on engines.

ME 145 Mechanical Engineering Laboratory**(2)**

Two three-hour laboratories, winter quarter, freshman year. Continuation of ME 144, with the introduction to experiments in steam and on steam engines. Laboratory experimental work continues the work on diesel engines as well as begins experiments in connection with steam engines, such as taking indicator cards, checking boiler efficiencies, checking pump efficiencies, taking flue gas analysis samples, and calculating horse power of steam engines from indicator cards. The practical work in the period will consist of more repair work on internal combustion engines as well as fitting valves on a steam engine, replacing packing, overhauling feed water pumps and washing boilers.

ME 146 Mechanical Engineering Laboratory**(2)**

Two three-hour laboratories; spring quarter; freshman year. Continuation of ME 145.

ME 202 Strength of Materials**(3)**

Three one-hour lectures, fall quarter, junior year. Study of fundamentals of the strength of materials with emphasis placed on materials used in construction and their properties. Methods of calculating the strength of simple beams, columns, struts, tie rods, riveted joints, etc. Recommended that a student should have PSc 201 prior to this course.

ME 203 Strength of Materials**(3)**

Three one-hour lectures, winter quarter, junior year. A continuation of ME 202 with special emphasis placed on the graphical method of solution of stress problems.

ME 205 Dynamics**(3)**

Three one-hour lectures, winter quarter, sophomore year. Study of the motion of points and bodies. Velocity, acceleration, inertia forces, introduction to libration studies.

Prerequisite: PSc 201

ME 223 Kinematics**(3)**

Two one-hour lectures and one three-hour drafting period, spring quarter, sophomore year. Motion of machine and mechanism parts. Gear, chain and belt drives; linkages.

Prerequisite: ME 205

ME 240 Additional Engineering Laboratory**(1-2)**

One or two three-hour laboratories, any quarter, sophomore year. Total credit limited to two units, with not more than two units in any one quarter.

ME 249 Strength of Materials Laboratory**(1)**

One three-hour laboratory; spring quarter; sophomore year. This course is taken in conjunction with the strength of materials class work, and the student will have an opportunity to run tension and compression test on materials, shearing tests, torque tests, in order to become familiar with the fundamentals of testing materials.

ME 311 Fluid Flow**(3)**

Three one-hour lectures; fall quarter; junior year. This course deals primarily with the friction losses, computation of friction losses of the flow of fluid in pipes. Consideration is given to such factors as the viscosity of fluids, roughness of conduit, and temperatures involved in the calculation of power required to force fluids through pipes.

ME 312 Fluid Flow**(3)**

Three one-hour lectures; winter quarter; junior year. This is a continuation of fluid flow offered in the fall quarter with special emphasis place on stratification of fluids in motion and the effect of motion on friction losses. In addition to the lectures and outside reading, there are a great many problems assigned in this course. Not only are liquids considered but also compressible fluids.

ME 313 Heat Transfer**(3)**

Three one-hour lectures; spring quarter; junior year. This course deals primarily with problems of transfer of heat from gases through metal containers to liquids, or from liquids to gases, as well as problems dealing with transfer of heat from one liquid through metal containers to another liquid. Many problems come up in this course dealing with radiation, heating, and ventilating, as well as the commercial application to heat transfer equipment and heat exchangers.

ME 323 Introduction to Machine Design**(3)**

Two one-hour lectures, one three-hour drafting room period; spring quarter; junior year. This is a combination of the application of motion to machine design and the fundamentals of design principles in the complete designing of pieces of equipment.

ME 331 Plumbing and Building Sanitation**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, junior year. Application of the theory of the hydraulics and pneumatics of the plumbing system to adequate design of the water supply and waste collection pipe layouts for buildings. The selection of mechanical equipment identified with control of hot water, illuminating gas, compressed air, humidification and chilled drinking water.

ME 345 Fluid Flow Laboratory**(1)**

One three-hour laboratory, winter quarter, junior year. Flow in pipes and open channels, measuring devices, pumps and pump accessories.

Prerequisite: ME 311

ME 400 Special Problems for Advanced Undergraduates**(1-2)**

One or two three-hour laboratories, any quarter, senior year. Total credit limited to four units, with not more than two units in any one quarter.

ME 401 Thermodynamics**(3)**

Three one-hour lectures; fall quarter; junior year. Introduction to fundamental principles of thermodynamics; deals with energy, transfer of energy, laws of thermodynamics, and the application of thermodynamics to gases.

ME 402 Thermodynamics**(3)**

Three one-hour lectures; winter quarter; junior year. Continuation of ME 401 with emphasis on combustion, thermodynamic cycles, and vapors.

ME 403 Thermodynamics**(3)**

Three one-hour lectures; spring quarter; junior year. Continuation of ME 402 with practical applications of thermodynamic cycles to standard heat equipment.

ME 421 Machine Design**(5)**

Three one-hour lectures, two three-hour laboratories; fall quarter; senior year. Lecture work and drafting room work are closely coordinated. The student in this course will take a problem and carry it through to completion, making all of the necessary calculations for the strength of the materials, and the kinematic diagrams for working out the types of motion that will show up in the design.

ME 422 Machine Design**(5)**

Three one-hour lectures, two three-hour drafting room periods; winter quarter; senior year. Continuation of ME 421 with more complicated design problems.

ME 423 Machine Design**(5)**

Three one-hour lectures, two three-hour drafting room periods; spring quarter; senior year. Continuation of ME 422, but in the drafting room the student is given the opportunity to specialize in a particular phase of design work.

ME 424, 425, 426 Mechanical Equipment of Buildings**(5) (5) (5)**

Three one-hour lectures and two three-hour laboratories; fall, winter, and spring quarters; senior year. Private water supplies and sewage disposal facilities, water supply piping and waste and vent piping in large building plumbing systems, booster pumps, water heaters, water softeners. Hydraulics of flow. Electric elevators, air conditioning equipment, fans, coils, compressors, acoustics of buildings, fire protection, standpipe and sprinkler systems, district heating, specifications, plans, and design problems.

Prerequisite: ME 331

ME 427 Manufacturing Processes**(5)**

Two one-hour lectures and three three-hour laboratories, fall quarter, senior year. The design and construction of dies used in die casting; powder metallurgy, plastic moulding, and punch press work; and materials and application of dies to manufacturing processes.

Prerequisite: ME 243 or 246

ME 428 Manufacturing Processes**(5)**

Two one-hour lectures and three three-hour laboratories, winter quarter, senior year. An advanced study of machine shop tools, processes, and materials, with experience in the operation of production tools. Problems dealing with grinding, hardening, balancing and gear cutting will be assigned.

Prerequisite: ME 427

ME 429 Manufacturing Processes**(5)**

Two one-hour lectures and three three-hour laboratories, spring quarter, senior year. Study of automatic and semiautomatic production tools and their application to various industries, as well as the organization of the shop for economical production.

ME 431 Engineering Surveying**(2)**

One-hour lecture and one three-hour field period, fall quarter, senior year. Selection, care, testing, and use of tapes and levels. Keeping and calculating field notes; land measurement by tape; practice in differential, profile, and contour leveling and the plotting of profiles. Earth volume by the borrow pit method.

ME 432 Engineering Surveying**(2)**

One hour lecture and one three-hour field period, winter quarter, senior year. Manipulation care and use of transit; measurement of horizontal and vertical angles, distance by stadia, straight line and distance by offset, area by tape and transit traverse topographic mapping by transit and stadia and by plane table and alidade interpolation of contour line and profiles from contour maps.

Prerequisite: ME 431 and high school or college trigonometry.

ME 433 Engineering Surveying**(2)**

One hour lecture and one three-hour field period, spring quarter, senior year. Parabolic curves, circular curves, cross sectioning, setting, slope stakes, measuring earth volume; cuts and fills as applied to road beds; determination of true-North line by observation of Polaris. Public lands survey and county records.

Prerequisite: ME 432

ME 461, 462 Undergraduate Thesis**(2) (2)**

Two one-hour meetings, fall and winter quarters, senior year. Thesis topics will be reviewed and a problem chosen by each student for development. Review work in thesis form, methodology, and research.

ME 463 Undergraduate Seminar**(2)**

Two one-hour meetings, spring quarter, senior year. The seminar course is designed primarily to assist students in keeping abreast of major developments in their chosen field. In addition to new developments, policies, practices, and procedures will be discussed through regular seminar. Each individual will be responsible for the development and presentation of a topic in his chosen field.

DESCRIPTIONS OF TECHNICAL COURSES IN MECHANICAL INDUSTRIES**ME 41 Mechanical Engineering Laboratory****(2)**

Two three-hour laboratories, fall quarter, sophomore year. The laboratory is located in the central heating plant for the campus in which there are Diesel engines connected to electric generators. These generating units are supplying part of the power to the campus. The student will obtain knowledge in the operation, maintenance and overhauling of Diesel engines, as well as taking indicator cards and running efficiency tests on the engines.

ME 42 Mechanical Engineering Laboratory**(2)**

Two three-hour laboratories, winter quarter, sophomore year. Continuation of ME 41, with an introduction of steam experiments and work with steam boilers. The student will have an opportunity to run efficiency tests on the boilers, check flue gas analysis and make water analysis of the boiler water, in addition to having experience in the operation of steam boilers. Each student will have an opportunity in this course to assist in the washing of the boilers, as well as maintenance and repair work.

ME 43 Mechanical Engineering Laboratory (2)

Two three-hour laboratories, spring quarter, sophomore year. Continuation of ME 42. Students also will have an opportunity to take indicator cards on steam engines, set valves, and run tests on feed water pumps.

ME 44 Analytic Mechanics (3)

Three one-hour lectures, fall quarter, sophomore year. This course is a review of the mechanics of physics from the technical student's point of view. It consists largely of lecture work and demonstrations and the solutions of problems. No calculus is required in this course, although the student should have a working knowledge of trigonometry.

ME 45 Strength of Materials (3)

Three one-hour lectures, winter quarter, sophomore year. An elementary course in strength of materials for technical students. Covers stresses in materials, strength of members, shearing strength of rivets and stresses in beams. Since this course is intended for technical students, no calculus is required.

ME 46 Strength of Materials (3)

Three one-hour lectures, spring quarter, sophomore year. Continuation of ME 45, with emphasis on the design of beams, deflection of beams, and strength of columns; graphic solution of problems.

ME 51 Power Plant Operation (3)

Three one-hour lectures, fall quarter, freshman year. Study of maintenance, operation, and repair of internal combustion engines, with special emphasis on the Diesel engine.

ME 52 Power Plant Operation (3)

Three one-hour lectures, winter quarter, freshman year. Continuation of ME 51, but special emphasis is placed upon the steam power plant, beginning with steam boilers and steam auxiliaries. The purpose of this course is to give the student a general knowledge of steam electric generating plants and the operation and maintenance of these plants.

ME 53 Power Plant Operation (3)

Three one-hour lectures, spring quarter, freshman year. Continuation of ME 52.

ME 55 Plumbing and Building Sanitation (4)

Three one-hour lectures and one three-hour drafting period, winter quarter, sophomore year.

RELATED COURSES IN ENGINEERING AND INDUSTRY

ELLARD W. BETZ
ENRICO BONGIO
ROBERT CONKLIN

*CHARLES MEINHART
C. C. RICHARDS
FRANCIS F. WHITING

RICHARD C. WILEY

DESCRIPTIONS OF COURSES IN MACHINE SHOP**ME 124 Machine Shop Practice (2)**

One hour lecture and one three-hour laboratory, fall quarter, freshman year. Fundamentals of bench work and use of machinist's hand tools; simple operations on the drill press, grinder, lathe, shaper, and milling machine; elementary tool grinding; elementary heat treatment of steel. Production of a circle cutter as a convenient radio construction tool. Primarily for electronic students.

ME 141 Bench Shop (1)

One three-hour period; fall quarter; freshman year. Fundamentals of bench work: Layout, chipping, filing, sawing, scraping, and use of taps and dies; drill press work: drilling, reaming, counterboring, spotfacing, and tapping; grinder work: off-hand grinding and tool sharpening; and elementary forging and heat treating of steel.

ME 142 Machine Shop (1)

One three-hour period; winter quarter; freshman year. Continuation of ME 141. Fundamental operations on the lathe: Facing, turning, taper turning, and thread cutting; also elementary operations on the shaper.

ME 143 Machine Shop (1)

One three-hour period; spring quarter; freshman year. Continuation of ME 142. More advanced operations on the lathe: Chuck work, drilling, boring, reaming, internal thread cutting, and mandrel work; elementary milling machine operations: plain milling and milling with the dividing head.

ME 241 Machine Shop (1)

One three-hour period; fall quarter; sophomore year. Continuation of ME 143. This course and ME 142, also ME 143, are designed for mechanical engineers, agricultural mechanics, and other students who want more machine shop work than that received in the required courses. Aeronautics students will also take ME 241 and ME 242, but will take ME 246 instead of ME 243. The student continues with more advanced lathe work: Chuck and faceplate work, use of steady and follower rests, collet work, machine fits; advanced milling machine work: spiral and vertical milling; advanced shaper work: angular cuts and keyway cutting; contour cutting on the metal band saw; and use of carbide cutting tools.

ME 242 Machine Shop (1)

One three-hour period; winter quarter; sophomore year. Continuation of ME 241. Advanced milling machine work as described in ME 241; begins elementary operations on the surface grinder, cylindrical grinder, tool and cutter grinder, radial drill, and the planer; these operations learned through general maintenance and repair problems.

ME 243 Machine Shop (1)

One three-hour period; spring quarter; sophomore year. Continuation of ME 242. Tooling and operation of the screw machine, mass production tooling of machine tools; advanced metallurgical and heat treating problems; general maintenance and repair problems.

* On military leave.

ME 246 Aero Machine Shop**(1)**

One three-hour period; spring quarter; sophomore year. Continuation of ME 242. This course is designed for aeronautics students and those who are interested in unusual setups on standard machine tools and who do not want work on screw machines or other mass production methods. Course will include precision layout and measurement; special finishing methods such as honing, lapping, and superfinishing; use of lathe milling attachment; thread grinding; metallurgical and heat treating problems. Work will parallel as closely as possible the work done in the aeronautical laboratories.

ME 340 Machine Shop Practice**(1-2)**

One or two three-hour periods, any quarter, junior or senior year. Total credit limited to four units, with not more than two units in any one quarter. Advanced individual instruction on all machine tools. Laboratory work consists of repairing and constructing equipment for campus shops and laboratories.

Prerequisite: ME 243

DESCRIPTIONS OF WELDING COURSES**ME 133 Welding Shop Practice****(2)**

One hour lecture and one three-hour laboratory, spring quarter, freshman year. Oxyacetylene and resistance welding instruction designed primarily for students of electronics. Covers equipment used, safety, basic technique, application and limitations of these phases of welding.

ME 151 Fundamentals of Oxyacetylene Welding**(1)**

One three-hour laboratory; fall quarter; freshman year. This course is designed for all beginning gas welders. It deals with the equipment used, safety precautions, and basic welding technique. The work is on light gauge sheet metal.

ME 152 Fundamentals of Oxyacetylene Welding**(1)**

One three-hour laboratory; winter quarter; freshman year. Continuation of ME 151. Advances the student into various welded joints, improves technique. Aero students begin work on tubing, with some basic weld tests. Others start work on heavier welding methods. A small amount of flame cutting is started in this quarter. Aeronautics students segregated in separate sections so course can be best fitted to their needs.

ME 153 Fundamentals of Oxyacetylene Welding**(1)**

One three-hour laboratory; spring quarter; freshman year. Continuation of ME 152. Aero students advance to aircraft tubing, further work on qualification test, some work on nonferrous metals. Others advance to some piping joints and connections. Limited work on nonferrous metals, using heavier oxyacetylene welding equipment. Further work in flame cutting. Separate sections for aeronautics students and refrigeration students.

ME 154 Fundamentals of Metallic Arc Welding**(1)**

One three-hour laboratory; fall quarter; sophomore year. This course deals with the equipment used, safety precautions, fundamentals of flame cutting of steel. The work consists mainly of the basic technique of heavy arc welding of steel plate. Types and uses of various electrodes, etc.

ME 155 Fundamentals of Metallic Arc Welding**(1)**

One three-hour laboratory; winter quarter; sophomore year. Continuation of ME 154. Advances the student to various welded joints, improves technique, further work in flame cutting. Basic theory of arc welding, uses and limits of this type welding.

ME 156 Fundamentals of Metallic Arc Welding**(1)**

One three-hour laboratory; spring quarter; sophomore year. Continuation of ME 155. Designed to improve skill and technique in arc welding. Beginning work on some nonferrous metals and alloys. Improves skill in flame cutting, industrial uses of flame cutting and flame machining. Basic weld tests.

ME 251 Advanced Welding

(1)

One three-hour laboratory; fall quarter; junior year. This advanced course is designed to give further work in nonferrous metals, pipe and layout work, uses and types of welded joints and strength of joints, weldability of steels and alloys. Beginning work in weld test laboratory. Separate sections for refrigeration, agricultural, mechanical engineering, and aeronautics students adapting the work to the section's needs.

ME 252 Advanced Welding

(1)

One three-hour laboratory; winter quarter; junior year. Continuation of ME 251. Further work in heavy oxyacetylene welding, flame cutting, specific applications, class projects, cost estimates, and further work on nonferrous metals and alloys. Special sections will be set up for aeronautics, refrigeration, and mechanical engineering students.

ME 253 Advanced Welding

(1)

One three-hour laboratory; spring quarter; junior year. Strength of Materials and Mechanical Drafting required. Work is with castings, low temperature brazing, layouts and cost estimates, inspection, and welding plant layouts. Special sections will be set up for agricultural, aeronautics, refrigeration, and mechanical engineering students.

ME 254 Advanced Arc Welding

(1)

One three-hour laboratory; fall quarter; sophomore year. Types and uses of welding equipment, portable welding equipment, fundamentals of pre-heating and stress annealing, weld tests and welding qualification tests, welding codes. Beginning work in weld test laboratory.

ME 255 Advanced Arc Welding

(1)

One three-hour laboratory; winter quarter; sophomore year. Continuation of ME 254. This course deals with estimating various welding jobs, special electrodes for alloy steels, further work with weld tests, weld metal, and testing methods.

Prerequisites: ME 202, 203, 249; ME 121, 122, 123

ME 341 Special Problems in Welding by Assignment

(1)

One three-hour laboratory; fall quarter; junior year. Physics of welding, fundamentals of welding metallurgy, weldability of steels (advanced), steels and alloys for welded construction.

ME 342 Special Problems in Welding by Assignment

(1)

One three-hour laboratory; winter quarter; junior year. Laboratory tests of welded joints, welding codes, other codes, engineering essentials.

ME 343 Special Problems in Welding Engineering

(1)

One three-hour laboratory; spring quarter; junior year. Welding design in construction, arc welded steel structures, design of pressure vessels, and weldments.

ME 434 Elements of Welding Design

(5)

Three one-hour lectures and two three-hour laboratories, fall quarter, senior year. Problems in cost estimating, design of simple weldments, use of resistance welding, and application of flanging and pressing.

Prerequisites: Open to Juniors and Seniors who have completed ME 123, 153, 156, 203, 249

ME 435 Elements of Welding Design

(5)

Three one-hour lectures and two three-hour laboratories, winter quarter, senior year. Continuation of ME 434. Further work in welding design problems, introduction to uses of inert-gas-shielded-arc welding, atomic hydrogen arc welding, and fundamentals of welding production control.

ME 436 Elements of Welding Design

(5)

Three one-hour lectures and two three-hour laboratories, spring quarter, senior year. Continuation of ME 435. Specific design work with welding codes, including A. W. S., A. S. M. E., A. P. I., and others. Problems in the design of products for automatic arc welding, time studies, and welding production control.

PRINTING DEPARTMENT

Department Head, A. M. FELLOWS

GUY K. CULBERTSON

C. HEROLD GREGORY

California State Polytechnic College offers a four-year curriculum leading to the Bachelor of Science degree in printing. Majors not only must complete satisfactorily all requirements, but must show proper aptitude and progress to indicate they will become competent and skilled craftsmen in the printing trades.

Facilities

The printing department is completely equipped with typesetting machines, platen presses, cylinder presses, automatic presses, folding machine, power paper cutters, perforators, punching machines, power stitchers, over 250 cases of new and modern type, stereotyping equipment, and bookbinding supplies.

Degree Curriculum

The four-year curriculum is designed to prepare men for positions of responsibility in the allied trades of the printing industry, as well as to prepare them to be owners and publishers of rural newspapers and print shops. In addition to courses in the major curriculum, students must meet all general requirements for graduation and must take a minimum of fifteen units of journalism. Courses in journalism are listed under the Department of Agricultural Journalism. The required courses are Jour 201, 202, 233, 401, and 403.

Placement

Students who successfully complete the four-year curriculum will be qualified to hold responsible positions in most branches of the allied trades of the printing industry. A graduate will have sufficient skill in all phases of printing and an adequate knowledge of management practices, so that he can advance rapidly to foremanship positions. A graduate is also well qualified to operate his own print shop, or to publish a small rural newspaper in connection with a job printing plant.

Students who are forced to drop out of school at the end of the second or third year, because of personal reasons, will have completed sufficient training to qualify them for less responsible positions in the printing industry.

DEGREE CURRICULUM IN PRINTING

	Freshman Year	F	W	S
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----		2		
English (Eng 104, 105, 106) -----		3	3	3
Elementary Typography (Pr 121) -----		3		
Platen Presswork (Pr 131, 132) -----		2	2	
History of Printing (Pr 101) -----		2		
Elementary Display (Pr 122) -----			3	
Introduction to Composing Machines (Pr 143) -----				3
Proofreading (Pr 102) -----			2	
Introduction to Cylinder Press (Pr 133) -----				2
Mathematics for Printers (Math 105) -----			3	
Press and Composing Room Problems (Pr 103) -----				2
Electives -----		4	3	6
		<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>

Sophomore Year	F	W	S
General Psychology (Psy 202, 203)-----		3	2
Machine Shop (ME 141, 142)-----	1	1	
American Government (Pol Sc 301)-----			3
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Imposition and Lockup (Pr 231)-----	3		
Composing Machine Operation (Pr 241, 242, 243)-----	3	3	3
Composing Machine Mechanism and Maintenance (Pr 222, 223)-----		2	2
Advanced Composition and Layout (Pr 221)-----	2		
Bindery Operations (Pr 251, 252)-----	1	1	
Stereotyping Operations (Pr 255)-----		2	
Advanced Presswork (Pr 232, 233)-----		3	3
Public Speaking (Eng 201)-----	2		
Electives-----	4	1	3
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Junior Year			
Literature-----	3	3	3
† General Chemistry (PSc 321, 322, 323)-----	4	4	4
Welding Shop (ME 151, 152)-----	1	1	
Advanced Machine Composition and Mechanism (Pr 321, 322, 323)-----	3	3	3
Press and Composing Room Problems (Pr 301, 302, 303)-----	1	1	1
Machine Composition—Magazines and Books (Pr 331)-----	2		
Newspaper Composition and Makeup (Pr 332)-----		2	
Advanced Typography (Pr 333)-----			2
Newspaper Layout and Makeup (Pr 342)-----		1	
Cost and Estimating (Pr 313)-----			1
Industrial Economics (Ec 313)-----			3
Electives-----	3	2	
	<hr/> 17	<hr/> 17	<hr/> 17
Senior Year			
Industrial Management (Ec 411)-----	3		
Industrial Relations (Ec 412)-----		3	
* Background of Modern Affairs (Hist 305)-----			3
Survey of U. S. History (Hist 304)-----		3	
Family Psychology (Psy 403)-----		3	
Plant Organization and Layout (Pr 433)-----			2
Cost and Estimating (Pr 411, 412, 413)-----	1	1	1
Production Problems (Pr 421, 422, 423)-----	3	3	3
Newspaper Accounting (Pr 403)-----			2
Undergraduate Thesis (Pr 461, 462)-----	2	2	
Undergraduate Seminar (Pr 463)-----			2
Electives-----	11	2	3
	<hr/> 17	<hr/> 17	<hr/> 16

DESCRIPTIONS OF COURSES IN PRINTING**Pr 101 History of Printing****(2)**

Two one-hour lectures, fall quarter, freshman year. A general study of historical development of printing from its beginning to the time of Gutenberg—continuing through the changes in materials and equipment to the highly developed industry of today.

Pr 102 Proofreading**(2)**

Two one-hour lectures, winter quarter, freshman year. Consists of a course in printshop English, proofreading, proofing, practical experience on college paper and publications. Study of standard proofmarks and practices.

* State and Local Government (Pol Sc 401) may be substituted.

† Or PSc 131, 132, 133.

Pr 103 Press and Composing Room Problems (2)

Two one-hour lectures, spring quarter, freshman year. The study and care of composing and pressroom equipment and methods, augmented by field trips and special instruction in overcoming problems that arise in every printing plant.

Pr 121 Elementary Typography (3)

One hour lecture, two three-hour laboratories, fall quarter, freshman year. Study and practice of the fundamentals and mechanics of typesetting, letterspacing, use of initials, proper forms and styles for poetry, setting straight matter, ruled forms, and break for colors. Learning to recognize and use type properly.

Pr 122 Elementary Display (3)

One hour lecture, two three-hour laboratories, winter quarter, freshman year. Employing the proper principles of display and use of ornaments and borders. Printing and designing blotters, business cards, letterheads, booklets. Markup and proper display and use of type.

Pr 131 Platen Presswork (2)

One hour lecture, one three-hour laboratory, fall quarter, freshman year. Introduction to the platen press. Instruction in care and maintenance, lockup of forms, makeready and nomenclature of all types of platen presses. Practical experience in feeding and operating.

Pr 132 Platen Presswork (2)

One hour lecture, one three-hour laboratory, winter quarter, freshman year. Continuation of Pr 131.

Pr 133 Introduction to Cylinder Press (2)

One hour lecture, one three-hour laboratory, spring quarter, freshman year. The study, operation, and care of the cylinder press, its maintenance and mechanism. Feeding and lockup for production of college paper and other publications are part of practical experience.

Pr 143 Introduction to Composing Machines (3)

Three three-hour laboratories, spring quarter, freshman year. Theory and operation of Linotype and Intertype composing machines. Keyboard practice and operation—setting all types of straight matter, and copy, job work. Special instruction in care and lubrication of machines.

Pr 221 Advanced Composition and Layout (2)

One hour lecture, one three-hour laboratory, fall quarter, sophomore year. Study and practice of the principles of hand display and layout of all types of commercial jobs, booklets, and publications. Proper methods of newspaper display and makeup. Application of copy fitting methods and markup.

Pr 222 Composing Machine Mechanism and Maintenance (2)

One hour lecture, one three-hour laboratory, winter quarter, sophomore year. Study of the assembling, casting, and distributing mechanism of typesetting and casting machines. Maintenance and repair of all composing and pressroom equipment. Development of service and maintenance charts. Field trips to other printing plants to study methods of maintenance.

Pr 223 Composing Machine Mechanism and Maintenance (2)

One hour lecture, one three-hour laboratory, spring quarter, sophomore year. Continuation of Pr 222.

Pr 231 Imposition and Lockup (3)

One hour lecture, two three-hour laboratories, fall quarter, sophomore year. The planning and laying out of forms in their proper position to be locked up ready for printing. Planning of dummies and proper spacing of pages and forms for all types of folding machines and printing presses.

Pr 232 Advanced Presswork (3)

One hour lecture, two three-hour laboratories, winter quarter, sophomore year. Advanced platen, cylinder, and automatic press operation. Research in proper make-ready, ink, paper, and other press problems. Study of color and process printing. Course augmented by talks by specialists and color and sound pictures from press manufacturers.

Pr 233 Advanced Presswork (3)

One hour lecture, two three-hour laboratories, spring quarter, sophomore year. Continuation of Pr 232.

Pr 241 Composing Machine Operation (3)

Three three-hour laboratories, fall quarter, sophomore year. This is a continuation of Pr 143. It deals with advanced operation and care of the Linotype machine. Training in the use of small caps, italics, initials, and special uses of matrices, ligatures, and logotypes. Special emphasis given to good typography, proper and established styles for setting tables, poetry, programs, announcements, using all advertising type faces, figures, etc.

Pr 242 Composing Machine Operation (3)

Three three-hour laboratories, winter quarter, sophomore year. Continuation of Pr 241.

Pr 243 Composing Machine Operation (3)

Three three-hour laboratories, spring quarter, sophomore year. Continuation of Pr 242.

Pr 251 Bindery Operations (1)

One three-hour laboratory, fall quarter, sophomore year. Practice in using all types of job shop bindery equipment, its maintenance and repair. Actual work of producing bindery operations on commercial bindery work, publications, and books.

Pr 252 Bindery Operations (1)

One three-hour laboratory, winter quarter, sophomore year. Continuation of Pr 251.

Pr 255 Stereotyping (2)

Two three-hour laboratories, winter quarter, sophomore year. Care and operation of stereotyping equipment, production from mats, shell casts and type-high cuts, routing and mortising methods as used on rural newspapers.

Pr 301 Press and Composing Room Problems (1)

One hour lecture, fall quarter, junior year. Analysis of methods and devices for coordinating all departments of the press and composing room to increase production, and reduce loss of time. Special field trips, showing of sound and color pictures to familiarize students with all makes of machinery and their purpose and operation.

Pr 302 Press and Composing Room Problems (1)

One hour lecture, winter quarter, junior year. Continuation of Pr 301.

Pr 303 Press and Composing Room Problems (1)

One hour lecture, spring quarter, junior year. Continuation of Pr 302.

Pr 313 Cost and Estimating (1)

One hour lecture, spring quarter, junior year. Study of detail involved in properly estimating and figuring cost on all classes of newspaper and job shop work.

Pr 321 Advanced Machine Composition and Mechanism (3)

One hour lecture, two three-hour laboratories, fall quarter, junior year. Continued and advance course in Pr 241, 242, 243. Field trips, lectures by experts, and sound pictures augment this course. Special emphasis on mechanism, repair and maintenance of typesetting and typecasting machines.

Pr 322 Advanced Machine Composition and Mechanism (3)

One hour lecture, two three-hour laboratories, winter quarter, junior year. Continuation of Pr 321.

Pr 323 Advanced Machine Composition and Mechanism (3)

One hour lecture, two three-hour laboratories, spring quarter, junior year. Continuation of Pr 322.

Pr 331 Machine Composition, Magazine and Book (2)

One hour lecture, one three-hour laboratory, fall quarter, junior year. Advanced course in linotype composition dealing with all types of magazine and book production. Instruction in setting all types of complicated and intricate copy.

Pr 332 Newspaper Composition and Makeup (2)

One hour lecture, one three-hour laboratory, winter quarter, junior year. Study and practical application of layout, advertising, makeup, proofreading, and all operations necessary for efficient production of rural newspapers and small job shops.

Pr 333 Advanced Typography (2)

One hour lecture, one three-hour laboratory, spring quarter, junior year. Designing and production of direct mail advertising pieces. Problems in book design, production, and binding.

Pr 342 Newspaper Layout and Makeup (1)

One three-hour laboratory, winter quarter, junior year. Study of fundamentals and practices of proper newspaper layout and makeup. This course designed to increase and develop skill in makeup and layout of advertising for rural newspapers.

Pr 403 Newspaper Accounting (2)

Two one-hour lectures, spring quarter, senior year. Training in bookkeeping and accounting as it applies to a rural newspaper and job shop.

Pr 411 Cost and Estimating (1)

One hour lecture, fall quarter, senior year. Elements of estimating on all classes of composition, press work, and bindery operations. Study of methods in establishing hourly rates in departments.

Pr 412 Cost and Estimating (1)

One hour lecture, winter quarter, senior year. Continuation of Pr 411.

Pr 413 Cost and Estimating (1)

One hour lecture, spring quarter, senior year. Continuation of Pr 412.

Pr 421 Production Problems (3)

One hour lecture, two three-hour laboratories, fall quarter, senior year. Analysis of methods for coordinating all factors of production. Methods of promoting inter-department harmony. Control of records and time cards given special emphasis.

Pr 422 Production Problems (3)

One hour lecture, two three-hour laboratories, winter quarter, senior year. Continuation of Pr 421.

Pr 423 Production Problems (3)

One hour lecture, two three-hour laboratories, spring quarter, senior year. Continuation of Pr 422.

Pr 433 Plant Organization and Layout (2)

One hour lecture, one three-hour laboratory, spring quarter, senior year. Planning and layout of printing equipment, proper use of materials and machinery to cut costs and increase production.

Pr 461, 462 Undergraduate Thesis (2) (2)

Two one-hour lectures, fall and winter quarters, senior year. Instruction in organization of material, proper research methods, and preparation of thesis required of all graduates.

Pr 463 Undergraduate Seminar (2)

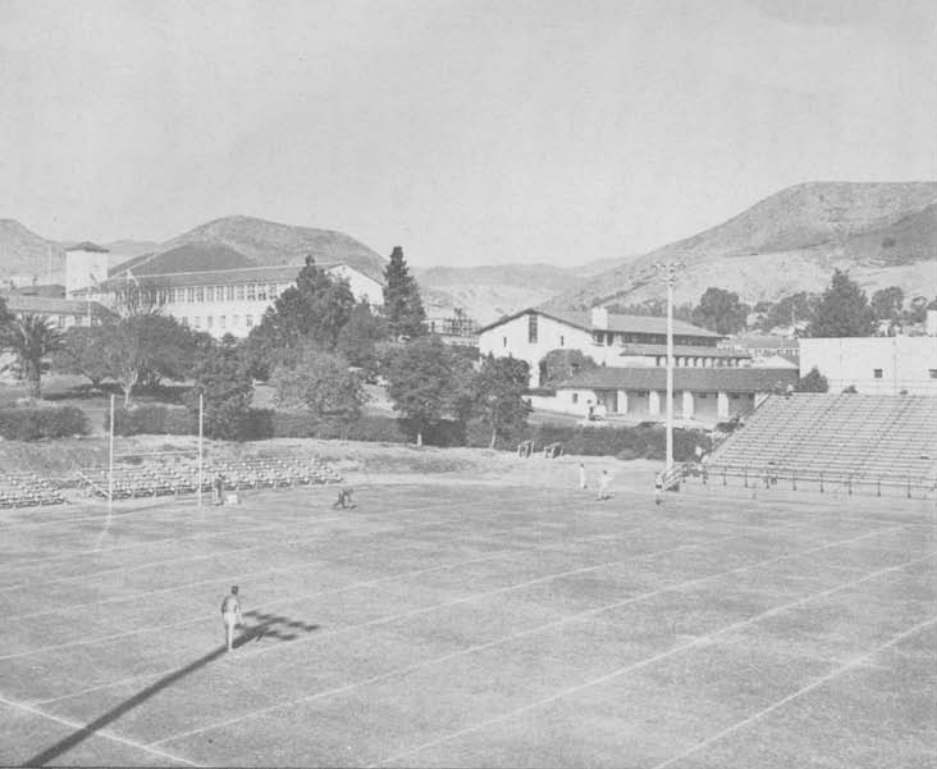
Two one-hour lectures, spring quarter, senior year. A discussion class designed to give senior students an opportunity to become familiar with all data gathered by other seniors in preparation of thesis material. Each student is required to conduct the seminar class, under supervision of the instructor, at least twice during the quarter.

LIBERAL ARTS DIVISION



Top: Majors in mathematics learn the applications of a new formula. *Center:* Social science majors discuss a political concept with an instructor.

Bottom: Students in the physical sciences watch an experiment conducted in one of the college chemistry laboratories.



Top: The college athletic plant includes a football stadium, recently enlarged with new steel bleachers seen at the right. The gymnasium, also just enlarged, and the natatorium are seen in the background on the right.

Right center: The college is a member of the California Collegiate Athletic Association and competes in all major sports with such schools as Los Angeles State, San Diego State, Santa Barbara College, Fresno State, and Pepperdine College.

Left center: A player slides into home on the college's new baseball diamond, part of a new \$60,000 athletic field which includes a track, practice football field and field house.



THE LIBERAL ARTS DIVISION

Although California State Polytechnic College prepares students primarily in the fields of agriculture and engineering, it is recognized that vocational proficiency is only one aspect of complete living. Men also need to be prepared to enjoy a richer and more useful personal, home, and community life.

In the Liberal Arts Division have been grouped for administrative purposes those subjects which are related to all aspects of living: vocational, civic, recreational, and aesthetic. It is the aim of the college to make instruction in these areas functional; therefore, there is as much emphasis as possible on the application of theory to the work in the Agricultural and Engineering Divisions.

The departments included in the Liberal Arts Division are: Agricultural Journalism, Biological Science, Education, English, Health and Physical Education, Mathematics, Music, Physical Science, and Social Science. Departmental majors are offered in Agricultural Journalism, Biological Science, Health and Physical Education, Mathematics, Physical Science, and Social Science. Preparation for the college's recommendation for California teaching credentials is provided by the Liberal Arts Division in cooperation with the Agricultural Division.

In the Education, English, and Music Departments, no departmental majors for meeting graduation requirements have been established at the present time. Selected courses in the Engineering and Agricultural Divisions, such as landscape design and architecture, may be used for meeting graduation requirements in the Liberal Arts Division.

All candidates for the Bachelor of Science degree in Liberal Arts, with majors in Biological Science, Health and Physical Education, Mathematics, Physical Science, or Social Science shall complete:

I. The general requirements for graduation.

II. The following division requirements:

- 2 hours of Personal Development
- 9 hours of Literature
- 9 hours of Principles of Economics
- 6 hours of College Mathematics
- 5 hours of General Psychology
- 6 hours of General Biology or equivalent
- 3 hours of Background of Modern Affairs or State and Local Government

III. Departmental requirements under one of the Liberal Arts Departments.

AGRICULTURAL JOURNALISMDepartment Head, **KEN KITCH****WILLIAM E. BUSH****JOHN R. HEALEY****ROBERT E. KENNEDY**

California State Polytechnic College offers the State's only college major in Agricultural Journalism. Majors train for jobs as writers, editors, advertising men (or combinations of these) on staffs of daily and weekly papers in agricultural areas, consumer and trade magazines in agricultural or allied fields, radio stations with farm programs, advertising departments and agencies merchandising agricultural products or services. Also, as direct-by-mail advertising and sales specialists, public relations directors, community or trade association organizers and secretaries, free-lance writers, etc.

While ordinary fields of journalism tend to be overcrowded, there is a definite shortage of journalists with agricultural backgrounds. Young men with inquiring minds, who like to write and wish to combine journalism and agriculture, are generally best fitted. Each major will be personally counseled by both the Head of the Journalism Department and the Dean of the Division of Agriculture. In filling enrollment, those with farm or small-town rearing will be given preference.

Facilities

Its nationally known Division of Agriculture and its active and well-equipped "School for Country Printers" put Cal Poly in unusually good position to give training seldom found elsewhere. Graduates not only learn ordinary journalistic techniques obtainable at other schools but gain firsthand experience in production methods and costs in the publishing field and are able to secure broad, practical experience in modern agricultural ideas and processes.

Journalism majors will be expected to serve as staff members on the school newspaper, various school magazines, the student news bureau and to cover various assignments for trade and consumer publications, press associations and newspapers.

Degree Curriculum

A total of 200 units is required for a B.S. Degree in Agricultural Journalism. Also required is a minimum eight weeks' internship during the summer quarter between the junior and senior years or at other time under circumstances approved by the Head of the Journalism Department and under supervision of the department's faculty. No credit is given. Such internship must consist of employment in a publishing, radio, advertising or public relations organization.

Special Programs

Special programs can be worked out with those wishing special-purpose training not leading to a degree.

DEGREE CURRICULUM IN JOURNALISM

	Freshman Year	F	W	S
English Composition (Eng 104, 105, 106)		3	3	3
Physical Education (PE 141, 142, 143)		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Personal Development (Psy 101)		2		
Agricultural Mathematics (Math 102, 103)			2	3
General Biology (BSc 101, 102, 103) or equivalent		3	3	3
Elementary Typography (Pr 121)		3		
Elementary Display (Pr 122)				3
Mathematics for Printers (Math 105)			3	
*Electives		6	6	4
		<u>17$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>

* Of elective units, 45 shall be taken from the field of agriculture with 12 from an approved major sequence to be taken during the freshman year. Both the freshman sequence and other agricultural electives are to be selected only after conference with the Dean of Agriculture and the Head of the Journalism Department. Unless a specific individual situation recommends, no more than 24 units will be taken in any one agricultural field.

Of nonagricultural elective units, at least 10 will be chosen from the field of journalism or a closely allied field.

Unless already an acceptable typist, majors will be required to take Jour 140 and/or 141 during their freshman year.

Sophomore Year			
	F	W	S
Principles of Economics (Ec 201, 202, 203)-----	3	3	3
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
General Psychology (Psy 202, 203)-----		3	2
Health and Hygiene (PE 107)-----	2		
General Physical Science or Physics or Chemistry-----	4	4	4
Public Speaking (Eng 201)-----			2
Introductory Journalism (Jour 201)-----	3		
Reporting (Jour 202)-----		3	
Editing and Copy Desk (Jour 233)-----			3
*Electives-----	4	4	4
	16 $\frac{1}{2}$	17 $\frac{1}{2}$	18 $\frac{1}{2}$
Junior Year			
American Government (Pol Sc 301)-----	3		
Survey of U. S. History (Hist 304)-----		3	
Background of Modern Affairs (Hist 305)-----			3
Agricultural Prices (Ec 403)-----			3
The American Scene (Eng 311, 312, 313)-----	3	3	3
Press Photography (Jour 322)-----		3	
Editorial and Feature Writing (Jour 302)-----		3	
Radio News (Jour 313)-----			3
*Electives-----	9	4	4
	15	16	16
Senior Year			
Family Psychology (Psy 403)-----			3
Principles of Marketing Agricultural Products (Ec 401)-----	3		
State and Local Government (Pol Sc 401)-----	3		
Undergraduate Thesis (Jour 461, 462)-----	2	2	
Undergraduate Seminar (Jour 463)-----			2
Newspaper and Magazine Advertising (Jour 401)-----	3		
Radio Advertising (Jour 402)-----		3	
Newspaper Management (Jour 403)-----			3
Public Relations (Jour 412)-----		3	
*Electives-----	7	7	8
	18	15	16

DESCRIPTIONS OF COURSES IN JOURNALISM

Jour 140 Typing (1)

Three one-hour periods, any quarter. Designed to teach the fundamentals of the touch system in the shortest time. Training is also given in making out business forms and the writing of letters.

Jour 141 Typing (1)

Three one-hour periods, any quarter. Continuation of Jour 11.
Prerequisite: Jour 11, or equivalent

Jour 201 Introductory Journalism (3)

Three one-hour lectures, fall quarter, sophomore year. An introduction to journalism, survey of its history, and study of techniques of writing the news story.

Prerequisites: Eng 104, 105, 106

* Of elective units, 45 shall be taken from the field of agriculture with 12 from an approved major sequence to be taken during the freshman year. Both the freshman sequence and other agricultural electives are to be selected only after conference with the Dean of Agriculture and the Head of the Journalism Department. Unless a specific individual situation recommends, no more than 24 units will be taken in any one agricultural field.

Of nonagricultural elective units, at least 10 will be chosen from the field of journalism or a closely allied field.

Unless already an acceptable typist, majors will be required to take Jour 140 and/or 141 during their freshman year.

Jour 202 Reporting**(3)**

Three one-hour lectures, winter quarter, sophomore year. Application of news writing principles to the reporting of news events. Study and practice in writing various types of news stories, including interviews and speeches. Ethical and legal problems in gathering and reporting news. Some attention to news-features.

Jour 233 Editing and Copy Desk**(3)**

Two one-hour lectures and one three-hour laboratory, spring quarter, sophomore year. Copy desk work, head writing, page make-up, special rewrite and editing problems, handling of correspondents, etc.

Prerequisites: Jour 202, Pr 121, Pr 122

Jour 251, 252, 253 Journalism Practice**(1-2) (1-2) (1-2)**

Three to six hours laboratory, any quarter, any year. Credit arranged for students holding editorial positions on college publications or student news bureau.

Prerequisite: One year of journalism or instructor's permission.

Jour 302 Editorial and Feature Writing**(3)**

Three one-hour lectures, winter quarter, junior year. Study of editorial and feature writing techniques. Study of markets for nonfiction articles; practice in gathering material and preparation of articles for technical and trade journals, particularly agricultural magazines.

Prerequisite: Jour 233

Jour 303 Advanced Feature Writing**(3)**

Three one-hour lectures, spring quarter, junior year. Continuation of 302 with emphasis on market research and preparation of articles for publication. Special attention given to photographic tie-ins.

Prerequisite: Jour 302 and 322 or 323

Jour 313 Radio News**(3)**

One hour lecture, one three-hour laboratory, spring quarter, junior year. Study of radio news programming, fundamentals of writing and editing for radio. Community interviews. Copy preparation. Commercial tie-ins.

Prerequisites: Jour 233, Eng 201

Jour 321 Elementary Photography**(3)**

One-hour lecture and two three-hour laboratories, fall quarter, junior year. For those who have had no or limited experience in photography. Picture-taking techniques and darkroom practices. Student must have an approved camera.

Jour 322 Press Photography**(3)**

One-hour lecture and two three-hour laboratories, winter quarter, junior year. Advanced picture-taking techniques and darkroom procedures applied directly to news and feature illustration for newspapers.

Prerequisites: Jour 201, 202. Student must have approved flash-equipped camera.

Jour 323 Free-lance Photography**(3)**

One-hour lecture and two three-hour laboratories, spring quarter, junior year. Technique of the picture story, magazine article illustration, livestock and industrial equipment photography, advertising photography.

Prerequisite: Jour 322

Jour 351, 352, 353 Journalism Practice**(1-2) (1-2) (1-2)**

Three to six hours laboratory, any quarter, any year. Credit arranged for students holding editorial positions on college publications or in student news bureau. Responsibilities more advanced than in 251, 252, and 253.

Prerequisite: One year of journalism

Jour 401 Newspaper and Magazine Advertising**(3)**

Two one-hour lectures, one three-hour laboratory, fall quarter, senior year. Study of advertising psychology, advertising salesmanship, copy, layout and production. Required for majors; recommended for students from other departments needing to know how to advertise and merchandise their own or others' products or services.

Prerequisite: Jour 233 or instructor's permission

Jour 402 Radio Advertising (3)

Two one-hour lectures, one three-hour laboratory, winter quarter, senior year. Survey of radio research methods, listenership studies, national networks, local chains, independents, production and transcription services, contracts, writing of commercials, spot announcements, etc.

Prerequisite: Jour 401

Jour 403 Newspaper Management (3)

Three one-hour lectures, spring quarter, senior year. Study of management problems in operation of smaller daily or weekly newspapers. Analysis of newspaper organization, circulation principles and practices, production problems and industrial relations.

Prerequisites: Jour 233, 401

Jour 412 Public Relations (3)

Three one-hour lectures, winter quarter, senior year. Study of methods employed in dissemination of public information by business, agricultural, industrial, educational and government organizations. Survey of media used, techniques commonly employed, formation and measurement of public opinion.

Jour 422 Rural Press (2)

Two one-hour lectures, winter quarter, senior year. Study of small or community newspapers. Emphasis on presentation of agricultural news and farm life features to suit interests of rural readers. Recommended as an elective for all Agricultural Journalism majors and for all prospective agricultural teachers.

Jour 461, 462 Undergraduate Thesis (2) (2)

Two one-hour lectures, fall and winter quarters, senior year. Designed to assist the student in meeting the thesis requirement under his major. Topics will be reviewed and chosen. Review work on thesis form, methodology and research.

Jour 463 Undergraduate Seminar (2)

One two-hour lecture, spring quarter, senior year. Round-table discussion of major political, economic and social developments that have public interest and significance to the journalist. Study of ethics of the press, its importance in a democracy, and responsibilities which it imposes on the journalist. The course also correlates and unifies the various phases of journalism studied previously and relates them to subjects studied in other fields.

BIOLOGICAL SCIENCE DEPARTMENT

Department Head, GLENN A. NOBLE

EUGENE C. BOVEE

FREDERICK M. ESSIG

DAVID H. THOMSON

ROBERT F. HOOVER

R. C. HATFIELD

Many positions with private organizations and with state and federal governments are open to men trained in the biological sciences. Most of these positions occur in the following fields: Biological survey, conservation of natural resources, entomology, experimental biology, fish and game, fisheries, forestry, natural history museums, oceanography, park naturalist, pest control, plant pathology, and teaching.

The courses in the biological sciences are organized to assist in the scientific training of students in the Agricultural Division, to contribute to the general education of students in the Liberal Arts Division, and to give students majoring in biology a thorough foundation in the scientific method, factual information, and philosophic outlook.

Animal biology, plant biology, insect biology, and applied genetics are designed for nondegree students, and for those students who have had an insufficient background for degree work. These courses do not carry degree credit toward meeting graduation requirements under the degree curricula. All other courses in the department carry degree credit.

Degree Curriculum

The Bachelor of Science degree is granted for successful completion of the degree courses as listed in the biological science curriculum. At least 54 units must be taken in the major field. Thirty-nine of these are required (see curriculum below), the other 15 may be selected from biological science offerings.

Graduate Work

A fifth year is offered by this department for those students who wish to advance beyond the Bachelor of Science level and for students who desire a general secondary teaching credential in biological science.

DEGREE CURRICULUM IN BIOLOGICAL SCIENCE

Freshman Year			
	F	W	S
English Composition (Eng 104, 105, 106) -----	3	3	3
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----		2	
Personal Development (Psy 101) -----	2		
Survey of Physical Science (PSc 101, 102, 103) -----	4	4	4
Intermediate Algebra (Math 107), College Algebra (Math 108) -	3	3	
General Botany (BSc 121, 122, 123) -----	4	4	4
* Electives -----		1	5
	16 $\frac{1}{2}$	17 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
Principles of Economics (Ec 201, 202, 203) -----	3	3	3
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
General Zoology (BSc 131, 132, 133) -----	4	4	4
Literature -----	3	3	3
Public Speaking (Eng 201) -----			2
Microtechnique (BSc 245) -----		2	
* Electives -----	6	4	4
	16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$

* In the four years, 15 hours must be in biological science courses approved by the adviser.

	Junior Year	F	W	S
General Psychology (Psy 202, 203) -----			3	2
General Bacteriology (BSc 221) -----	4			
Genetics (BSc 303) -----				3
American Government (Pol Sc 301) -----	3			
Survey of United States History (Hist 304) -----			3	
Background of Modern Affairs (Hist 305) -----				3
General Chemistry (PSc 321, 322, 323) -----	4	4		4
* Electives -----	6	7		5
	17	17		17
	Senior Year			
State and Local Government (PolSc 401) -----	3			
Family Psychology (Psy 403) -----				3
Organic Chemistry (PSc 326) -----		4		
Undergraduate Thesis (BSc 461, 462) -----	2	2		
Undergraduate Seminar (BSc 463) -----				2
* Electives -----	12	10		11
	17	16		16

DESCRIPTIONS OF COURSES IN BIOLOGICAL SCIENCE

BSc 11 Animal Biology (3)

Three one-hour lectures, fall quarter, freshman year. Elementary principles of animal structure and functions.

BSc 14 Plant Biology (3)

Three one-hour lectures, fall quarter, freshman year. Plant structure and functions related to agriculture.

BSc 19 Applied Genetics (3)

Three one-hour lectures, spring quarter, freshman year. Introductory study of the practical applications of genetic principles in plant and animal breeding.

Prerequisite: BSc 11 or 14

BSc 101, 102, 103 General Biology (3) (3) (3)

Three one-hour lectures; fall, winter, and spring quarters; freshman year. The composition and processes of life; a survey of plants and animals; human biology; heredity, eugenics, and evolution; the balance of nature.

BSc 121, 122, 123 General Botany (4) (4) (4)

Two one-hour lectures and two three-hour laboratories; fall, winter and spring quarters; freshman year. Basic botany; principles of plant structure and functions.

BSc 126 General Entomology (4)

Three one-hour lectures and one three-hour laboratory, spring quarter, freshman year. A generalized study of insects; special reference given to life histories, economic importance, and control; insect collection required.

BSc 131, 132, 133 General Zoology (4) (4) (4)

Two one-hour lectures and two three-hour laboratories; fall, winter, and spring quarters; freshman year. Basic zoology, principles of animal structure and functions.

BSc 141, 142, 143 Biological Techniques (2) (2) (2)

Two three-hour laboratories; fall, winter, and spring quarters; freshman year; course may be begun any quarter. Preparation of biological specimens for display or study purposes. Students select projects from such fields as collecting, preservation, casts and molds, taxidermy, study-skins, mounting skeletons, microtechnique.

* In the four years, 15 hours must be in biological science courses approved by the adviser.

BSc 221 General Bacteriology

(4)

Three one-hour lectures and one three-hour laboratory, fall quarter, sophomore year. Morphology, classification, physiology, and cultivation of bacteria; relation of bacteria to health of man, animals, and plants.

Prerequisite: BSc 103 or BSc 122 or BSc 132

BSc 222 Dairy Bacteriology

(3)

Two one-hour lectures and one three-hour laboratory period, winter quarter, sophomore year. An advanced course dealing with bacteria of milk, butter, cheese, ice cream, and evaporated milk.

Prerequisite: BSc 221

BSc 223 General Plant Pathology

(4)

Three one-hour lectures and one three-hour laboratory, spring quarter, sophomore year. Principal diseases of plants; symptoms, control methods.

Prerequisite: BSc 122

BSc 226 Vertebrate Field Zoology

(4)

Two one-hour lectures and two three-hour laboratories, spring quarter, junior year. The identification, life history and economic importance of vertebrates with emphasis on birds and mammals.

Prerequisite: BSc 103 or BSc 122 or BSc 132

BSc 237 Human Anatomy

(3)

Two one-hour lectures and one three-hour laboratory, fall quarter, sophomore year. An elementary study of the structural aspects of the organ systems of man.

Prerequisite: BSc 101 or BSc 131

BSc 238, 239 Human Physiology

(3) (3)

Two one-hour lectures and one three-hour laboratory; winter and spring quarters; freshman year. The bodily functions of man.

Prerequisite: BSc 237

BSc 243 Taxonomy of Higher Plants

(2)

Two three-hour laboratories or field trips, spring quarter, sophomore year. General principles of classification of flowering plants; procedure for identification of unknown plants; preparation and use of specimens.

Prerequisite: BSc 122

BSc 245 Microtechnique

(2)

Two three-hour laboratories, winter quarter, sophomore year. Methods of preparing plant and animal tissue for microscopic study.

BSc 303 Genetics

(3)

Three one-hour lectures, spring quarter, junior year. Study of the principles of heredity and variation.

Prerequisite: BSc 101 or BSc 121 or BSc 131

BSc 324 Plant Pathology

(3)

Two one-hour lectures and one three-hour laboratory, fall quarter, junior year. Plant diseases of environmental, virus, bacterial, and fungus origin; systematic mycology sufficient for identification of pathogens.

Prerequisite: BSc 223

BSc 325 Plant and Animal Ecology

(3)

Two one-hour lectures and one three-hour laboratory, winter quarter, junior year. The response of plants and animals to their environment.

Prerequisite: BSc 103 or BSc 122 or BSc 132

BSc 326 Comparative Anatomy of Vertebrates

(4)

Two one-hour lectures and two three-hour laboratories, spring quarter, junior year. The comparative development and morphology of chordate organs and organ systems.

Prerequisite: BSc 132

BSc 331 Insect Taxonomy (3)

Two one-hour lectures and one three-hour laboratory, fall quarter, junior year. A study of the orders and important families of insects. Methods and techniques of systematic entomology. Insect collection required.

Prerequisite: BSc 126

BSc 433 Wildlife Management (4)

Three one-hour lectures and one three-hour laboratory or field trip, spring quarter, senior year. The general problems and techniques of wildlife management such as rodent control, wildlife conservation, fish and game management.

Prerequisite: BSc 226

BSc 461, 462 Undergraduate Thesis (2) (2)

Two one-hour meetings, fall and winter quarters, senior year. Selection and development of problem, preparation of manuscript.

BSc 463 Undergraduate Seminar (2)

Two one-hour meetings, spring quarter, senior year. A discussion of periodicals in the field of biology, and review of thesis problems.

BSc 521 Curriculum and Methods in Biological Science (3)

Two one-hour lectures and one three-hour observation laboratory, fall quarter, graduate year. A survey of the curricula, methods, devices, and procedures that may be effectively used in organizing and conducting high school biology courses.

BSc 522 Histology (4)

Two one-hour lectures and two three-hour laboratories, winter quarter, graduate year. The study of tissues and microscopic organology of vertebrates.

Prerequisite: Graduate standing

BSc 523 Plant and Animal Cytology (3)

Two one-hour lectures and one three-hour laboratory, spring quarter, graduate year. The detailed study of plant and animal cells.

Prerequisite: Graduate standing

BSc 581, 582, 583 Special Problems (3) (3) (3)

Meetings, discussions, and library research involving special problems.

Prerequisite: Graduate standing

EDUCATION AND PSYCHOLOGY

DALE W. ANDREWS
 HERBERT H. BURLINGHAM
 ARTHUR G. BUTZBACH
 MORRIS G. GARTER

NORMAN S. GOULD
 ROBERT MAURER
 OBERLIN B. NERESON
 HUBERT H. SEMANS

The department of Education and Psychology attempts to develop the ability to apply basic principles of human behavior in the fields of mental health, human relations, and learning. Each student is provided with understandings necessary for becoming more self-directive in his relationships with his own environment. Stress is laid upon certain specific skills of value in daily living, and for students in the college's teacher training program, upon skills and techniques of special value in teaching.

The student interested in teacher preparation should see the section under Admissions, Registration, and Graduation for information about requirements and programs to prepare for the Special Secondary Credential in Vocational Agriculture, the Special Limited Secondary Credential in Agriculture, the Special Secondary Credential in Physical Education, and the General Secondary Credential.

DESCRIPTIONS OF COURSES IN EDUCATION**Ed 301 Principles of Secondary Education (3)**

Three one-hour lectures, fall or spring quarter, junior year. An introduction to the profession of secondary school teaching; analyzing teaching as a vocation; orienting students in what is required of a good teacher; stressing the objectives, functions, and curricula of secondary schools.

Ed 303 Teaching Plans and Techniques (3)

Three one-hour lectures, fall or spring quarter, junior year. General methods of obtaining expected student outcomes as related to the unit of study, lesson planning, specific manual skills, planning course content. Study of difficulties encountered by the beginning teacher; discipline, time planning, class management, utilization of community resources.

Prerequisite: Ed 312

Ed 312 Educational Psychology (5)

Five one-hour lectures, winter quarter, junior year. Growth and developmental psychology stressing individual differences, motivation, psychology of school groups, mental hygiene, and the principles of learning applicable in the classroom.

Prerequisites: Psy 202, 203

Ed 401 Audio-visual Aids (3)

Three one-hour meetings, fall or spring quarter, senior year. Various kinds of visual and auditory aids of value in classroom teaching in secondary schools are explored by lecture, discussion, demonstration, previewing, and laboratory work. Emphasis is on the planned and integrated use of these aids in the classroom as well as on the theoretical foundations.

Prerequisite: Ed 312 or permission of instructor

Ed 421 Directed Teaching (9-12)

Fall, winter, or spring quarter; senior or graduate year. Supervised practice in teaching high school classes in the teaching credential candidate's major field of preparation. High schools in the vicinity of California State Polytechnic College cooperate in the directed teaching program. In the case of prospective vocational agriculture teachers, practice is carried on in a selected high school known as the "critic center." Directed teaching is done by the vocational agriculture candidate in the vocational agriculture department at the critic center under the supervision of the local vocational agriculture instructor, the California State Polytechnic College, and the California State Bureau of Agricultural Education.

Ed 424 Vocational Agriculture Department Organization (3)

Fall, winter, and spring quarters, graduate year. For cadet teachers in agricultural education as a part of the total participating experience during the directed teaching period. Principles and practices in organizing and providing the facilities and materials for operating the local program in vocational agriculture.

Ed 501 History and Philosophy of Education (3)

Three one-hour lectures, fall quarter, graduate year. A description of twentieth-century educational theories, practices, trends, and organizations, and their sources in past and present thought and social change. The development of American educational objectives and institutions is stressed. On the philosophical side, the nature and backgrounds of contemporary idealistic and materialistic educational theories are brought out. The increase of the student teacher's capacity to adjust to his professional life, to think independently on educational problems, and to interpret and evaluate the aims of contemporary schools are central objectives of the course.

Ed 502 Public School Administration (3)

Three one-hour lectures, winter quarter, graduate year. A study of administrative problems associated with the operation of schools and school systems as they affect the teacher. Attention will be given to the individual school, the city and state school system, the federal government in education, and the State Education Code as it affects teachers. Administrative principles and practices will be evaluated in the light of current educational theory, curriculum trends, and social developments.

Ed 503 Guidance in Secondary Schools (3)

Three one-hour lectures, spring quarter, graduate year. A study of the objectives of educational and vocational guidance, the major problems encountered in a teaching situation, and the procedures used in gaining an understanding of the individual's interests, aptitudes, and personality factors in relation to job opportunities.

Ed 504 Evaluation in Secondary Education (3)

Three one-hour lectures, fall quarter, graduate year. Preparation and use of teacher-made objective-as-to-scoring tests; new objective tests; check lists and rating scales. A study of supplementary observational techniques. The use of all such devices in evaluation. Assigning grades and reporting results.

Ed 505 Educational Sociology (3)

Three one-hour lectures, winter quarter, graduate year. The sociological backgrounds of school children; the effects of social, economic, and political trends, and issues on education; the problems of leisure, recreation, and occupations; and modern interpretations of democratic ideology are among the topics treated. The sociological problems studied are utilized in defining the social objectives of the school.

Ed 506 Adult and Continuation Education (3)

Three one-hour lectures, spring quarter, graduate year. The organization, administration, and teaching of public school vocational and general education classes for "out-of-school" youth and adults. Attention will be given to the history and philosophy of the adult education movement. The agencies concerned with adult education—professional, federal, state and local—and their contributions to the field will be considered. Adult education programs of certain California cities and rural programs in adult education will be studied. Students will have an opportunity to relate work of the course to their professional interests. Required of vocational agriculture cadets in conjunction with directed teaching.

*** Ed 521 Curriculum and Methods in Vocational Agriculture (3)**

Two one-hour lectures, one three-hour observation laboratory, fall or spring quarter, graduate year. This course is planned to give prospective teachers of vocational agriculture a knowledge of the methods, devices, and procedures that may be effectively used in presenting work to high school vocational agriculture students.

* Curriculum and Methods courses in other majors are listed under departmental offerings.

Ed 522 Methods in Teaching Agricultural Mechanics**(5)**

Five one-hour lectures, five three-hour laboratories plus individual assignments. A six-weeks course offered twice during the winter quarter, graduate year. For cadet teachers in agricultural education. Principles, practices, and methods in directing activities of pupils in agricultural mechanics classes in secondary schools.

Ed 524 Methods in Supervising Farming Programs**(5)**

Five three-hour demonstration and discussion meetings, fall and spring quarters, graduate year. For cadet teachers in agricultural education as a part of the required training for teachers of vocational agriculture. Practices, methods, and skills in supervising the farming projects of pupils in vocational agriculture.

Ed 581 Seminar in Vocational Education and Guidance**(3)**

Three one-hour lectures, fall quarter, graduate year. Current problems and recent trends in vocational education and vocational guidance. An advanced course for teachers in and directors of public secondary school vocational education departments.

Ed 601 S Introduction to Vocational Agriculture**(3)**

A study of the organization and administration of high school vocational agriculture departments. Open to prospective agriculture teachers as a part of the Summer Cadet Training Program.

Ed 604 S Problems in Vocational Agriculture**(3)**

Problems relative to high school vocational agriculture departments, including veteran's training, young farmer groups, and adult classes. Open to prospective agriculture teachers as a part of the Summer Cadet Training Program.

Ed 607 S Directed Group Study in Agricultural Education**(3)**

Group study of the problems involved in selecting subject matter and planning the course of study for high school vocational agriculture departments. Open to prospective agriculture teachers as a part of the Summer Cadet Training Program.

Ed 621 S Agricultural Skills**(1)**

One week, summer session. Various agricultural skills determined by circularizing vocational agriculture teachers and designed to meet their needs in the teaching of vocational agriculture students.

Ed 631 S Conference, Agriculture Teaching Problems**(1)**

One week, summer session. A series of lectures, seminars, demonstrations, and discussions of agriculture education teaching problems, led by specialists in agriculture education for professional improvement of teaching of vocational agriculture.

DESCRIPTIONS OF COURSES IN PSYCHOLOGY**Psy 101 Personal Development****(2)**

Two one-hour lectures, fall quarter, freshman year. An introduction to college life for freshmen. This course takes up study techniques, vocational and educational planning, opportunities at California State Polytechnic College, and certain aspects of personal adjustment psychology.

Psy 202, 203 General Psychology**(3) (2)**

Three one-hour lectures, winter quarter; two one-hour lectures, spring quarter; sophomore year. A survey of the objectives, methods, and experimentally attested facts of the science are presented, stressing normal adult psychology and its application to the prediction and control of human behavior. The course is conducted by means of lectures, demonstrations, assigned readings, and discussions.

Psy 403 Family Psychology**(3)**

Three one-hour lectures, spring quarter, senior year. Three lectures. The study of premarital relations, including the necessary factors for successful marriage. Choosing a mate, budgeting, causes for divorce, and factors of religion are some of the topics considered.

ENGLISH AND PUBLIC SPEAKING

Chairman, DAVID M. GRANT

MORRIS G. GARTER
CHARLES H. LANG

WILLIAM LEARY
ENA MARSTON

JOHN RIEBEL
JAMES S. SMITH

Courses in English are designed to serve three purposes: First, to help the student develop the habit of sound thinking and logical organizing of material; second, to provide opportunity for the student to use language accurately, clearly, and interestingly, both in speaking and in writing; and third, to develop the technique of reading to the point of understanding others' ideas and of recognizing that literature is an interpretation of life.

The English 11, 12, 13 course sequence is required of all students in either the vocational or technical curriculum. The English 104, 105, 106 course sequence is required of all students in degree curricula, except those who enter with credit in freshman composition. English 104, 105, 106 may be substituted for English 11, 12, 13; but neither English 11, 12, 13, nor public speaking and journalism courses, may be substituted for English 104, 105, 106.

For the purpose of assigning entering students to the course which seems best to provide them with needed experience in composition, a placement test is given, except to those who enter with credit in freshman English. Students in vocational or technical curricula whose test scores reveal considerable deficiency in language will be enrolled in English 1. Upon satisfactory completion of this course, the students will be eligible for English 11. Students in the degree curricula who show deficiency will be assigned to English 4, a preparatory course. A passing grade in this course entitles students to advance to English 104. If students fail English 4, they must repeat the course.

Remedial reading is offered as a special service to any student who is assigned to the program by his adviser or who wishes to take advantage of the service. This is a developmental program designed to help those who feel a need for improved reading skills. Lectures, demonstrations of good reading habits, practice exercises in technical and nontechnical reading, frequent progress tests, and a rigorous program of sensory training through high-speed exposure of selected materials are given. Those wishing to avail themselves of this service should set aside two hours per week. Regular attendance is required.

DESCRIPTIONS OF COURSES IN ENGLISH AND PUBLIC SPEAKING

Eng 1 Basic Communication (3)

Three one-hour lectures for all technical and vocational students who need remedial work before entering English 11. Sentence structure, good usage, spelling, and paragraphing through writing based on the student's major interest, as well as on directed reading. Discussion on improvement in study habits.

Eng 4 Preparatory English (3)

Three one-hour lectures, any quarter, freshman year. For the degree student who needs remedial work before entering English 104. The organization of ideas into logical, clear sentences and paragraphs, taught primarily through intensive writing based on the student's interests and experience.

Eng 11 Technical English (3)

Three one-hour lectures, fall quarter, freshman year. Introduction to the modern business letter with emphasis on content and form.

Eng 12 Technical English (3)

Three one-hour lectures, winter quarter, freshman year. Extensive practice in the writing of such special business letter types as routine inquiry and reply, sales, application, credit and collection, complaint and adjustment.

Eng 13 Technical English**(3)**

Three one-hour lectures, spring quarter, freshman year. Business and technical reports, civil service blanks, tax forms; the essentials of practical public speaking, with some consideration of the use of speech-recording devices.

Eng 104 English Composition**(3)**

Three one-hour lectures, fall quarter, freshman year. Expository writing; selecting and limiting the subject; logical organization of ideas; paragraph development; eliminating errors in sentence structure and punctuation; reading for comprehension.

Eng 105 English Composition**(3)**

Three one-hour lectures, winter quarter, freshman year. Critical evaluation of everyday reading materials to develop skills in analysis and interpretation. Study of the major difficulties in communication. Practice in writing to cope with these difficulties and apply these skills. Use of library resources to verify facts, substantiate judgments.

Eng 106 English Composition**(3)**

Three one-hour lectures, spring quarter, freshman year. Reading of selections chosen to pose contemporary human problems of wide relevance. Writing of papers designed to reveal the student's understanding of these problems and his own reaction to them. Continued use of library resources for further exploring of ideas.

Eng 201 Public Speaking**(2)**

Two one-hour lectures, any quarter, sophomore year. Training in selecting a subject with emphasis on the student's major interest, gathering material, organizing and presenting speeches for all occasions. Introduction to the sales speech and employment interview. Study of the student's speech through wire recording.

Prerequisite: Eng 11 or 104

Eng 203 Public Speaking**(2)**

Two one-hour lectures, spring quarter, sophomore year. Training for leadership and constructive participation in round-table discussions and parliamentary situations. Emphasis on speech in business, with special attention to the employment interview and business committee meetings. Familiarization with speech-recording devices and radio speaking techniques.

Eng 211 Readings in Literature of the Western World**(3)**

Three one-hour lectures, fall quarter, sophomore year. A consideration, through the study of significant Western World literature, of the problems of man and the material world—his reaction to nature, science, and machinery.

Prerequisite: Eng 13 or 106

Eng 212 Readings in Literature of the Western World**(3)**

Three one-hour lectures, winter quarter, sophomore year. A consideration, through the study of significant Western World literature, of the problems of man and the social world—his search for social, political, and economic stability.

Prerequisite: Eng 13 or 106

Eng 213 Readings in Literature of the Western World**(3)**

Three one-hour lectures, spring quarter, sophomore year. A consideration, through the study of significant Western World literature, of the problems of man and the inner world—his attempt to understand himself through psychology, religion, and philosophy.

Prerequisite: Eng 13 or 106

Eng 301 Report Writing**(3)**

Three one-hour lectures, fall quarter, junior year. Practice in routine business correspondence followed by a study of the engineering report, technical article, and research paper.

Prerequisite: Eng 13 or 106

Eng 311 The American Scene**(3)**

Three one-hour lectures, fall quarter, junior year. A study of the correlation between American social, political, and economic concepts, and the writing that has expressed them, as background for understanding present problems. Includes discussion, collateral reading, and critical writing.

Prerequisite: Eng 13 or 106 or permission of the instructor

Eng 312 The American Scene**(3)**

Three one-hour lectures, winter quarter, junior year. A consideration of the most significant American religious, philosophical, and humanitarian attitudes, and the writing that has expressed them, as background for understanding present problems. Includes discussion, collateral reading, and critical writing.

Prerequisite: Eng 13 or 106 or permission of the instructor

Eng 313 The American Scene**(3)**

Three one-hour lectures, spring quarter, junior year. A presentation of the main currents of American political, economic, humanitarian, religious, and philosophical thought as reflected in major literary works from the beginnings to the present, as background for understanding present problems and interpreting current American writing. Includes discussion, collateral reading, and critical writing.

Prerequisite: Eng 311 or 312

Eng 402 Advanced Letter Writing**(2)**

Two one-hour lectures, winter quarter, senior year. Advanced letter writing problems, with special emphasis on applications, inquiries, questionnaires, and the psychology of modern business letters.

Prerequisite: Eng 106 and junior standing, or permission of the instructor

HEALTH AND PHYSICAL EDUCATION DEPARTMENT

Department Head, ROBERT MOTT

RICHARD ANDERSON
F. SHELDON HARDEN
HOWARD O'DANIELS

LEROY HUGHES
JAMES JENSEN
EDWARD JORGENSEN

GEORGE D. PROUSE

The Department of Health and Physical Education offers physical activities for all, designed to provide a sound program of recreation, education in physical skills, and the give-and-take of games. Varsity teams in 12 intercollegiate sports offer opportunity for the more skilled. There are limited freshman schedules in three sports. Intramural teams provide year-around competition in a dozen sports at an easier level of play to all who wish to enter. Instruction and practice in physical skills are provided through regular physical education classes for freshmen and sophomores. Health instruction is given to all freshmen through a two-unit course in hygiene. A medical examination is required of all entering students.

The Department of Health and Physical Education offers preparation for California State Polytechnic College's recommendation for two teaching credentials. These are the Special Secondary Credential in Physical Education and the General Secondary Credential with a major or minor in Physical Education. The department's work is coordinated with that of the Education Department and is under the supervision of a college-wide committee on teacher education.

Facilities

Extensive outdoor facilities include: stadium field for football; a large grass-covered area for physical education classes, intramural sports, and football practice; regulation baseball diamond; a quarter-mile oval track with a 220-yard straightaway; basketball, volleyball, tennis, and handball courts.

Indoor facilities include: basketball court; equipment for boxing, wrestling, and gymnastics; regulation 75 foot pool; shower and individual locker facilities to accommodate three sport squads at one time.

Degree Curriculum

Successful completion of the four-year curriculum in this major entitles the student to receive the Bachelor of Science degree in science and humanities with a major in health and physical education. A Special Secondary Credential may be secured by including credential requirements in the degree curriculum.

Graduate Work

Graduate work is offered for those majors in physical education who wish to qualify for the General Secondary Credential. The specific requirements for this credential will be found in the section of the catalog on teacher preparation.

DEGREE CURRICULUM IN HEALTH AND PHYSICAL EDUCATION

	Freshman Year	F	W	S
English Composition (Eng 104, 105, 106) -----		3	3	3
Intermediate Algebra (Math 107) -----		3		
College Algebra (Math 108) -----			3	
Personal Development (Psy 101) -----		2		
Health and Hygiene (PE 107) -----				2
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Safety and First Aid (PE 101) -----		2		
Community Recreation (PE 106) -----				3
Swimming and Water Sports (PE 103) -----				2
Intramural Sports (PE 202) -----			3	
General Zoology (BSc 131, 132) -----		4	4	
Public Speaking (Eng 201) -----				2
Electives -----		2	3	4
		<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>

Sophomore Year			
	F	W	S
Principle of Economics (Ec 201, 202, 203) -----	3	3	3
General Psychology (Psy 202, 203) -----		3	2
Survey of Physical Science or Chemistry -----	4	4	4
Public Speaking (Eng 203) -----	2		
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Human Anatomy (BSc 237) -----	3		
Human Physiology (BSc 238, 239) -----		3	3
Principles of P. E. (PE 201) -----	3		
Apparatus and Gymnastics (PE 222) -----		2	
Health Education (PE 203) -----			2
Electives -----	1	2	2
	16 $\frac{1}{2}$	17 $\frac{1}{2}$	16 $\frac{1}{2}$
Junior Year			
American Government (Pol Sc 301) -----	3		
* Survey of U. S. History (Hist 304) -----			3
Literature -----	3	3	3
Educational Psychology (Ed 312) -----		5	
Football Coaching Theory and Practice (PE 321) -----	2		
Track and Field Theory and Practice (PE 331) -----	2		
Baseball Theory and Practice (PE 323) -----			2
Elementary Physical Education Activities (PE 332) -----		3	
Physiology of Exercise (PE 303) -----			2
Techniques of Officiating (PE 311) -----	2		
Physical Education Activity (PE 341, 342, 343) -----	1	1	1
Kinesiology (PE 302) -----		2	
Electives -----	4	2	6
	17	16	17
Senior Year			
State and Local Government (Pol Sc 401) -----			3
Undergraduate Thesis (PE 461, 462) -----	2	2	
Undergraduate Seminar (PE 463) -----			2
Background of Modern Affairs (Hist 305) -----	3		
Family Psychology (Psy 403) -----		3	
Basketball Theory and Practice (PE 422) -----		2	
Minor Sports Theory and Practice (PE 423) -----			3
Organization and Administration of P. E. (PE 401) -----	3		
Tests and Measurements in P. E. (PE 412) -----		3	
School Health Administration (PE 405) -----		2	
Athletic Training and Massage (PE 432) -----		1	
Corrective Physical Education (PE 406) -----			2
† Electives -----	9	4	6
	17	17	16

DESCRIPTIONS OF COURSES IN HEALTH AND PHYSICAL EDUCATION

PE 101 Safety and First Aid (2)

Freshman year; fall quarter.

A standard American Red Cross First Aid course which gives instruction and practice in the immediate and temporary care of injuries and sudden illness.

PE 103 Swimming and Water Sports Theory and Practice (2)

Freshman year; spring quarter. A course in the supervision of pool activities. Swimming instruction and safety are stressed.

PE 106 Community Recreation (3)

Spring quarter; freshman year. The supervision and administration of community recreation are considered. Games and activities suitable for a community recreation program are studied.

* Social Science minors should take History 301, 302, 303 in lieu of this course.

† Recommended in mathematics, social studies, or science.

PE 107 Health and Hygiene (2)

Two one-hour lectures; fall or winter quarter; freshman year. A course covering personal hygiene and health education and the relation of exercise, nutrition and application of the rules of hygiene in maintaining physical and mental health. Included in this course are units in fire prevention, public safety, and alcohol and other drugs. Required for freshmen and sophomores.

PE 141 Physical Education (½)

Three one-hour laboratory periods; fall quarter; freshman year. Fundamentals of sports and games.

PE 142 Physical Education (½)

Three one-hour laboratory periods; winter quarter; freshman year. Tumbling and apparatus work; defense activities (boxing and wrestling); gymnastics and calisthenics.

PE 143 Physical Education (½)

Three one-hour laboratory periods; spring quarter; freshman year. Continuation of PE 141, 142. Sports activities; physical tests; progressive activities.

PE 144, 145 Physical Education (½) (½)

Three one-hour laboratory periods; fall and winter quarters; freshman year. Beginning swimming for all who do not pass college swimming test.

PE 151, 152, 153 Competitive Athletics (½) (½) (½)

Fall, winter, and spring quarters; freshman year. May be substituted for required physical training during fall quarter by those qualified to compete in inter-collegiate sports program.

PE 201 Principles of Physical Education (3)

Three one-hour lectures, fall quarter, sophomore year. A study of the history of physical education and the concept of physical education as a profession. The important correlation between principles and methods is emphasized.

PE 202 Intramural Sports (3)

Sophomore year; winter quarter. A study of sports adapted to intramural use. Organization of intramural programs is stressed.

PE 203 Health Education (2)

Fall quarter; sophomore year. The purpose of this course is to acquaint students of physical education, teachers in service, and others with the broad general nature of health problems in schools.

PE 222 Apparatus and Gymnastics (2)

Sophomore year; winter quarter. Theoretical and practical work on light and heavy apparatus. Acquisition of proficiency in the performance of tumbling and gymnastic stunts. Emphasis on progression and teaching technique.

PE 241 Sports Education (½)

Three one-hour laboratory periods; fall quarter; sophomore year. Devoted to the training in and competition of seasonal sports such as speed ball, touch football, and tennis.

PE 242 Sports Education (½)

Three one-hour laboratory periods; winter quarter; sophomore year. Devoted to training in and completion of seasonal sports such as basketball, badminton, volleyball, boxing, and wrestling.

PE 243 Sports Education (½)

Three one-hour laboratory periods; spring quarter; sophomore year. Devoted to training in and competition of seasonal sports such as tennis, track and cross country running, softball, and soccer.

PE 245 Advanced Swimming and Water Sports (½)

May qualify for lifesaving tests.

PE 251, 252, 253 Competitive Athletics (½) (½) (½)

Fall, winter, and spring quarters; sophomore year. May be substituted for required physical training during fall quarter by those qualified to compete in inter-collegiate sports program.

PE 300 Safety Education (3)

Fall quarter. A study of the problems and attitudes in the field of home, fire, industrial, and traffic safety. Prevention of accidents in these areas will be stressed.

PE 302 Kinesiology (2)

Junior year, winter quarter. Study of body movements from the standpoint of energy, leverage, angle positions, sequence and efficiency as applied to sports and working conditions.

PE 303 Physiology of Exercise (2)

Spring quarter, junior year. Effects of various forms of physical activity on the circulatory, respiratory, and other physiological processes; physiological problem in athletic competition.

PE 311 Techniques of Officiating (2)

Fall quarter, junior year. Instruction and practice in the techniques of officiating all sports.

PE 320 Driver Education and Driver Training (3)

Winter quarter. A course designed to instruct prospective teachers in the recommended procedures to be used in training drivers of high school ages. Driver education will deal with attitudes and practices. Driver training will demonstrate behind-the-wheel teaching techniques.

PE 321 Football Coaching Theory and Practice (2)

Junior year; fall quarter. The course covers fundamentals of offense and defense, as well as systems of offense and team defense. Consideration is given to rules of the game.

PE 323 Baseball Coaching Theory and Practice (2)

Junior year; spring quarter. The study of the technique of the individual fundamentals of the sport and the methods of teaching team play in these activities.

PE 331 Track and Field Coaching Theory and Practice (2)

Junior year, fall quarter. A course for instruction in the coaching technique of the various events in track and field. Special consideration is given to problems of team balance, and study of rules.

PE 332 Elementary Physical Education Activities (3)

Winter quarter, junior year. Modern trend in materials and methods for the elementary school program in physical education. The place of rhythms and dances, games, calisthenics, self-testing activities, marching tactics, and miscellaneous activities.

PE 341, 342, 343 Physical Education Activity (1) (1) (1)

Junior year; fall, winter, and spring quarters. This course runs through three quarters and is required of all majors in physical education. Students participate in regular physical education classes.

PE 401 Organization and Administration of Health and Physical Education (3)

Senior year; fall quarter. A course in the management and control of physical education and health education. Special consideration is given to organizing programs in class work and athletics. Problems of control and maintenance of fields, floors, and locker rooms are studied.

PE 403 Curriculum and Methods in Health and Physical Education (3)

Senior year; spring quarter. The function of methods in obtaining desirable objectives in physical education. Methods include: motivation, class management, choice of activities, selection of teaching devices, and the measurement of the results.

PE 405 School Health Administration (2)

Winter quarter, senior year. A course dealing with current procedures and practices in the administration of the school health program. The problems of this field will be analyzed and the use of recommended procedures will be stressed.

PE 406 Corrective Physical Education (2)

Two one-hour lectures, spring quarter, senior year. Group procedure in the administration of individual exercise for the correction of various defects in body mechanics.

PE 412 Tests and Measurements in Physical Education (3)

Senior year, winter quarter. Consideration is given to the use of physical tests and measurement of skill, strength, speed and endurance as a basis for grading and as a measure of progress in activities.

PE 422 Basketball Coaching Theory and Practice (2)

Senior year, winter quarter. A study of the fundamental individual basketball skills. The different theories of offensive and defensive team play will be represented and analyzed.

PE 423 Minor Sports Theory and Practice (3)

Senior year, spring quarter. A course in techniques of minor sports. There is special emphasis on fundamentals in tennis, golf, boxing, wrestling, and gymnastics, and the place of these sports in a school program.

PE 432 Athletic Training and Massage (1)

Winter quarter, senior year. Modern principles and practice in conditioning and care of athletes. Theory and practice in the scientific manipulation of the muscles as related to therapeutic exercise.

PE 461, 462 Undergraduate Thesis (2) (2)

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis, selection of the problem, general development of the topic, and final preparation of the manuscript.

PE 463 Undergraduate Seminar (2)

Two one-hour meetings, spring quarter, senior year. The purpose of this course is to provide a means through which students may discuss through seminar methods new developments in their specific fields.

PE 501 Advanced Corrective Physical Education (3)

Three one-hour lectures, fall quarter, graduate year. Advanced techniques in the detection of defective body mechanics and establishment of class procedures for prevention and elimination of these defects.

Prerequisite: PE 406

PE 502 Advanced Seminar in Problems of Physical Education (3)

Three one-hour lectures, winter quarter, graduate year. A study of practical problems in physical education and their solution in terms of desired objectives in this field.

PE 512 Advanced Personal Hygiene (3)

Three one-hour lectures, winter quarter, graduate year. An advanced course in problems of healthful living and rules of hygiene. Problems of school hygiene will be considered.

PE 513 Research Techniques in Physical Education (4)

Four one-hour lectures, spring quarter, graduate year. A study of tools of research as applied to the field of physical education. Problems of measurement, of surveys, of job analysis and testing are considered.

MATHEMATICS DEPARTMENT

Department Head, MILO E. WHITSON

DAVID W. COOK
CHARLES A. ELSTON
CLYDE P. FISHER

V. A. FOLSOM
VANCE D. LEWIS
CLAUDE A. PURSEL

RALPH E. WESTON
JOHN WOODWORTH

The purpose of the Mathematics Department is to offer instruction suited to the needs of students in agriculture, engineering and liberal arts. Instruction, while not neglecting fundamental mathematical principles, is essentially different from that in which the aim is preparation for research. Mathematical concepts are logically developed, but also presented from the viewpoint of their application. Students who find themselves lacking in preparation will find listed courses to suit their needs, as will also the technical students interested in the applied aspects of mathematics. The prospective student should, if possible, plan his high school work to include three semesters of algebra, one of trigonometry, and two of geometry.

Tests are given to entering students to determine their facility and preparation in mathematics. The results of these tests are used to help in placing the new student in courses where he will most likely succeed. Students in the Engineering and Industrial Division and in the Liberal Arts Division who have had adequate preparation will normally begin their college work in mathematics with course 107, if degree students, or with course 11, if technical. Students in the Agricultural Division normally begin with course 102, if degree students, or with course 15, if technical.

Degree Curriculum

A curriculum leading to a Bachelor of Science degree is offered by the Mathematics Department. A mathematics major should complete 54 units or more of major work as outlined in the curriculum below. Eighteen units of the 54 must be in applied mathematics.

Graduate Work

A fifth year of work is offered to the mathematics department for those students who wish to qualify for a General Secondary Credential with a mathematics major or minor.

DEGREE CURRICULUM IN MATHEMATICS

	Freshman Year	F	W	S
Intermediate Algebra (Math 107) -----		3		
College Algebra (Math 108) -----			3	
Analytic Geometry (Math 109) -----				3
English Composition (Eng 104, 105, 106) -----		3	3	3
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health Education (PE 107) -----				2
General Physics (PSc 131, 132, 133) -----		4	4	4
Personal Development (Psy 101) -----		2		
Elective in Mathematics -----			3	
Electives -----		4	3	4
		16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$
	Sophomore Year			
Differential and Integral Calculus (Math 201, 202, 203) -----		3	3	3
General Psychology (Psy 202, 203) -----			3	2
Principles of Economics (Ec 201, 202, 203) -----		3	3	3
Physical Education (PE 241, 242, 243) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Public Speaking (Eng 201) -----		2		
Elective in Applied Mathematics -----				3
Electives -----		8	7	5
		16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$

	Junior Year	F	W	S
Differential Equations (Math 301, 302)-----		2	2	
Engineering Problems (Math 313)-----				3
General Biology or equivalent-----		3	3	
Literature-----		3	3	3
American Government (Pol Sc 301)-----		3		
Survey of United States History (Hist 304)-----			3	
Theory of Equations (Math 307, 308)-----		3	3	
Elective in Mathematics-----				5
Electives-----		3	3	6
		17	17	17
	Senior Year			
Undergraduate Thesis (Math 461, 462)-----		2	2	
Undergraduate Seminar (Math 463)-----				2
State and Local Government (Pol Sc 401)-----				3
Background of Modern Affairs (Hist 305)-----		3		
Family Psychology (Psy 403)-----				3
Electives in Mathematics-----		3	3	
Electives-----		9	12	9
		17	17	17

DESCRIPTIONS OF COURSES IN MATHEMATICS

Math 1 Practical Mathematics (2)

Two one-hour lectures, fall quarter, freshman year. Minimum essentials of mathematics for practical purposes. Deals with fractions, decimals, solution of equations, farm measurements, and a review of fundamental operations. Required of all students in agriculture except those who pass a satisfactory placement examination.

Math 4 Preparatory Algebra (3)

Three one-hour lectures, fall quarter, freshman year. A refresher course in beginning algebra for those students whose previous preparation is inadequate or who need review work.

Math 5 Preparatory Algebra (3)

Three one-hour lectures, winter quarter, freshman year. A continuation of Math 4.

Math 11 Mathematics for Technical Students (3)

Three one-hour lectures, fall quarter, freshman year. Simple operations of the slide rule, arithmetic with applications and the fundamental operations in algebra.

Prerequisites: Satisfactory score on entrance examination

Math 12 Mathematics for Technical Students (3)

Three one-hour lectures, winter quarter, freshman year. A continuation of Math 11, including solution of linear equations and formulas, systems of linear equations, quadratic equations, graphical representation, and use of logarithms.

Prerequisite: Math 11

Math 13 Mathematics for Technical Students (3)

Three one-hour lectures, spring quarter, freshman year. A continuation of Math 12, including functions of angles, the right triangle, functions of two angles, and sine and cosine laws with applications to engineering problems.

Prerequisite: Math 12

Math 15 Mathematics for Technical Agriculture Students (3)

Three one-hour lectures, winter quarter, freshman year. Consists of mathematical concepts and problems which are commonly found in practical agriculture such as: ratio and proportion, percentages, Pearson's square, areas and volumes, construction costs, levers, pulleys, and power.

Prerequisite: Satisfactory score on entrance examination or Math 1

Math 102 Agricultural Mathematics (2)

Two one-hour lectures, winter quarter, freshman year. Percentage, feed and fertilizer and spray mixtures, equations, lengths, areas, volumes, ratio and proportion with emphasis upon the applications to practical agricultural problems.

Prerequisites: Satisfactory score on agricultural mathematics entrance examination or Math 1, and satisfactory score in algebra entrance examination or Math 4

Math 103 Agricultural Mathematics (3)

Three one-hour lectures, spring quarter, freshman year. Elementary elements of trigonometry with emphasis upon agricultural applications, averages, modes, medians, standard deviations, graphs, concrete mixtures, lumber measure, volumes of stacks and silos, exponents, logarithms, slide rule, and special applications to the major fields of agriculture.

Prerequisite: Math 102

Math 104 Computations and Slide Rule (1)

One-hour lecture, fall quarter, freshman year. Operation of the slide rule and methods of computation used primarily in engineering.

Math 105 Mathematics for Printers (3)

Three one-hour lectures, spring quarter, freshman year. Technical applications of mathematics to printing such as: point system, spacing, type measure and weight, type metal, proportion, margins, copy-fitting, imposition, and estimating.

Prerequisite: Satisfactory score on entrance examination or Math 1

Math 106 Trigonometry (3)

Three one-hour lectures, spring quarter, freshman year. Logarithms, solution of right and oblique triangles, fundamental trigonometric relationships, trigonometric and exponential equations.

Prerequisite: Math 107

Math 107 Intermediate Algebra (3)

Three one-hour lectures, fall quarter, freshman year. Selected topics from algebra, including quadratic equations.

Prerequisite: Satisfactory score on entrance examination or Math 5

Math 108 College Algebra (3)

Three one-hour lectures, winter quarter, freshman year. Systems of quadratics, progressions, complex numbers, determinants, and elementary theory of equations.

Prerequisites: Math 107, Math 106 or its equivalent. (Math 106 may be taken concurrently with Math 108.)

Math 109 Analytic Geometry (3)

Three one-hour lectures, spring quarter, freshman year. Analysis of the straight line, conic sections, higher plane curves, parametric equations, and polar coordinate system.

Prerequisites: Math 106 and Math 108, or equivalents.

Math 201 Differential and Integral Calculus (3)

Three one-hour lectures, fall quarter, sophomore year. Differentiation of polynomial functions. Interpretation of the derivative and its application to problems in geometry, mechanics, and other fields. Definition and use of indefinite integral as an inverse operation. Evaluation of the definite integral.

Prerequisite: Math 109 or equivalent.

Math 202 Differential and Integral Calculus (3)

Three one-hour lectures, winter quarter, sophomore year. Integration as a process of summation with emphasis upon physical problems involving such integration. Differentiation of transcendental functions. Applications to parametric and polar equations.

Prerequisite: Math 201 or equivalent.

Math 203 Differential and Integral Calculus**(3)**

Three one-hour lectures, spring quarter, sophomore year. Rolle's theorem and law of mean value. Integration of transcendental functions by: use of algebraic and trigonometric substitutions, parts, partial fractions, and tables. Introduction to infinite series.

Prerequisite: Math 202 or equivalent.

Math 211 First Course in Statistical Method**(3)**

Three one-hour lectures, fall quarter, sophomore year. The formation and graphical representation of the frequency table; averages, their uses and interpretations; measure of variability; elementary probability and the normal probability curve; reliability of averages and of measures of variability; linear correlation.

Prerequisite: Math 107 or Math 103.

Math 213 Elementary Mathematical Analysis of Engineering Problems**(2)**

Two one-hour lectures, spring quarter, sophomore year. Selected problems from engineering fields which are solvable by elementary mathematics.

Prerequisite: Math 202 or equivalent.

Math 301 Differential Equations**(2)**

Two one-hour lectures, fall quarter, junior year. Review of infinite series and hyperbolic functions, formation of differential equations, and first-order differential equations through homogeneous equations and their applications.

Prerequisite: Math 203.

Math 302 Differential Equations**(2)**

Two one-hour lectures, winter quarter, junior year. Linear equations with variable and with constant coefficients. Applications to various engineering problems are emphasized.

Prerequisite: Math 301.

Math 303 Differential Equations**(2)**

Two one-hour lectures, spring quarter, junior year. Certain higher order equations, simultaneous equations, series solutions, and introduction to Bessel functions.

Prerequisite: Math 302.

Math 307 Introduction to Theory of Equations**(3)**

Three one-hour lectures, winter quarter, junior year. Complex numbers, general theorems on algebraic equations, solution of the general cubic and quartic, numerical approximation to the roots of an n th degree equation.

Prerequisite: Math 201.

Math 308 Theory of Equations and Determinants**(3)**

Three one-hour lectures, spring quarter, junior year. N th order determinants and their application to the solution of simultaneous linear equations. Resultants, discriminants, eliminants, and Graeffe's method of locating complex roots.

Prerequisite: Math 308.

Math 313 Mathematical Analysis of Engineering Problems**(3)**

Three one-hour lectures, spring quarter, junior year. Application of the methods of analysis to selected problems in engineering, physics, and allied fields.

Prerequisite: Math 302.

Math 401 Non-Euclidian Geometry**(3)**

Three one-hour lectures, fall quarter, senior year. Introduction to geometrics based on systems of postulates other than those of Euclid.

Math 402 Secondary School Mathematics**(3)**

Three one-hour lectures, winter quarter, senior year. Study of the nature and human significance of secondary school mathematics. Evaluation of content and texts used in general mathematics and elementary algebra.

Prerequisite: Math 203.

Math 403 Secondary School Mathematics (3)

Three one-hour lectures, spring quarter, senior year. Evaluation of content and texts of second year algebra, geometry, and trigonometry. Emphasis upon practical applications of secondary school mathematics.

Prerequisite: Math 402.

Math 411 Mathematical Analysis of Engineering Problems (3)

Three one-hour lectures, fall quarter, senior year. A continuation of Math 313. Further applications of the methods of analysis to selected problems in engineering, physics, and allied fields.

Prerequisite: Math 313.

Math 412 Advanced Calculus (3)

Three one-hour lectures, winter quarter, senior year. Limits and continuity, derivatives and differentials, Riemann integration.

Prerequisite: Math 203.

Math 413 Advanced Calculus (3)

Three one-hour lectures, spring quarter, senior year. Multiple integration, infinite series, power series, and their applications.

Prerequisite: Math 412.

Math 461, 462 Undergraduate Thesis (2) (2)

Two one-hour meetings, fall and winter quarters, senior year. This course is designed and given for the specific purpose of training students in the development of theses. It covers the selection of the topic, the general development of the topic, and final preparation of the manuscript.

Math 463 Undergraduate Seminar (2)

One two-hour meeting, spring quarter, senior year. The purpose of this course is to provide a means through which students may discuss through seminar methods new developments in their specific fields.

Math 500 Introduction to Theory of Functions of a Complex Variable (3)

Three one-hour lectures, one quarter, graduate year. Complex variable theory and its application to certain technical problems.

Prerequisite: Math 302

Math 502 Vector Analysis (2)

Two one-hour lectures, winter quarter, graduate year. The algebra of vectors, with its applications to geometry, physics, and engineering problems. The introduction to differential and integral calculus of vector functions.

Prerequisite: Math 203.

Math 503 Vector Analysis (2)

Two one-hour lectures, spring quarter, graduate year. The calculus of vector functions, the use of the gradient, curl, divergence, and rotor. Applications of vector analytic methods to geometry, physics, and engineering problems.

Prerequisite: Math 502.

Math 510 Foundations of Mathematics (3)

Three one-hour lectures, one quarter, graduate year. The essential logical ideas basic to mathematics, nature of postulational thinking, and the history of the development of mathematics.

Math 521 Curriculum and Methods in Mathematics (3)

Three one-hour lectures, fall quarter, graduate year. Modern tendencies and general aims of secondary school mathematics. Objectives and methods of general mathematics, algebra, geometry, and trigonometry.

Math 580 Seminar (1, 2 or 3)

One-hour meetings, one quarter, graduate year. Topics in advanced mathematics chosen according to the interests and needs of the students enrolled.

MUSIC DEPARTMENT

Chairman, HAROLD P. DAVIDSON

The purpose of the courses offered in the Music Department is twofold: First, to give all musically inclined students the opportunity of participating in college musical organizations; second, to give all students interested in music a broader insight into the general field of music through courses in appreciation, theory, and harmony. Full credit is given in all courses of music.

It is necessary that the student have some previous experience with a musical instrument in order to try out for band and orchestra. Inasmuch as the principal purpose in applied music is to give the student real enjoyment in group participation and the opportunity of enriching the experience of the entire student body by performing before it, regular attendance and a thorough interest in the organization are necessary factors. Smaller groups are organized from the band and orchestra to provide additional offerings for the public relations program of the college.

While previous experience in chorus singing is helpful, it is not mandatory for the student in trying out for the Glee Club. It is necessary that the student be able to sing a part, have a pleasing tone quality, have a thorough enjoyment of Glee Club participation, be regular in attendance, and be willing to devote extra time for the engagements necessary to fulfill the obligations of the Music Department. Quartets, soloists, and octets are organized from the Glee Club. These organizations and soloists perform before student body groups and the many clubs and organizations of San Luis Obispo and of the surrounding area.

The college regards the Music Department as one of its finest media for promoting public relations throughout the State. The band not only appears before the student body at each assembly and at the many gatherings, but takes trips with the athletic teams. The Glee Club, orchestra, quartets, octet, and soloists not only appear before the student body and the many organizations of the community, but a selected group goes on an annual week's tour to various sections of the State.

For the general student, courses are offered in music appreciation and theory. A course in harmony is given for the student who cares to specialize.

DESCRIPTIONS OF COURSES IN MUSIC

Mu 141, 142, 143 Orchestra (2) (2) (2)

Two three-hour periods; fall, winter, spring; freshman year. Limited to those who have had considerable experience. The orchestra student has an opportunity to play for various college entertainments.

Mu 151, 152, 153 Band (1) (1) (1)

One three-hour period; fall, winter, spring; freshman year. Limited to those students who have had experience with band instruments. The band plays for many college functions.

Mu 154, 155, 156 Glee Club (1-2) (1-2) (1-2)

Two one and one-half hour periods; fall, winter, spring; freshman year. All types of four-part compositions are sung. Fundamentals of breathing, tone production, diction, and interpretation are stressed. Several quartets and soloists are developed each year for radio work for which additional credit may be given. The club sponsors an annual tour and entertainment, besides the usual engagements.

Mu 202 Music Theory (3)

Three one-hour lectures, winter quarter. A course including the elements of music theory; construction of major and minor scales, intervals, rhythms, sight singing and sight reading, musical terms, syllable work.

Mu 203 Harmony and Theory (3)

Three one-hour lectures, spring quarter. A course containing the study of melodic form. Recognition, construction, and use of primary chords and inversions. The study of cadences; enharmonic change; harmonization of simple melody; and arranging for four-part men's voices.

Mu 204 Music Appreciation (2)

Two one-hour lectures, fall quarter. A general cultural course designed to facilitate the enjoyment of music and an intelligent appreciation of great musicians and their masterpieces. A survey of forms, materials, and composers found in modern radio and concert programs presented through lectures and recordings. The course includes the study of choirs and instruments of the symphony orchestra, and their origin; the development of folk songs into symphonic themes and treatment; the study of contemporary artists.

Mu 205 Music Appreciation (2)

Two one-hour lectures, winter quarter. A continuation of Mu 204.

Mu 206 Music Appreciation (2)

Two one-hour lectures, spring quarter. A continuation of Mu 205.

Mu 241, 242, 243 Orchestra (2) (2) (2)

Two three-hour periods; fall, winter, spring; sophomore year. Continuation of Mu 141, 142, 143.

Mu 251, 252, 253 Band (1) (1) (1)

One three-hour period; fall, winter, spring; sophomore year. Continuation of Mu 151, 152, 153.

Mu 254, 255, 256 Glee Club (1-2) (1-2) (1-2)

Two one and one-half hour periods; fall, winter, spring; sophomore year. Continuation of Mu 154, 155, 156.

Mu 341, 342, 343 Orchestra (2) (2) (2)

Two three-hour periods; fall, winter, spring; junior year. Continuation of Mu 241, 242, 243.

Mu 351, 352, 353 Band (1) (1) (1)

One three-hour period; fall, winter, spring; junior year. Continuation of Mu 251, 252, 253.

Mu 354, 355, 356 Glee Club (1-2) (1-2) (1-2)

Two one and one-half hour periods; fall, winter, spring; junior year. Continuation of Mu 254, 255, 256.

Mu 441, 442, 443 Orchestra (2) (2) (2)

Two three-hour periods; fall, winter, spring; senior year. Continuation of Mu 341, 342, 343.

Mu 451, 452, 453 Band (1) (1) (1)

One three-hour period; fall, winter, spring; senior year. Continuation of Mu 351, 352, 353.

Mu 454, 455, 456 Glee Club (1-2) (1-2) (1-2)

Two one and one-half hour periods; fall, winter, spring; senior year. Continuation of Mu 354, 355, 356.

PHYSICAL SCIENCE DEPARTMENT

Department Head, WOODFORD E. BOWLS

WILLIAM E. BUSH
LEWIS E. HAMMITT
JOHN A. HARDYROBERT E. HOLMQUIST
A. L. HOUK
*BRUCE KENNELLYTHEODORE MATTHEW
F. K. MILHAM
TORLIEF M. RICKANSRUD

During the past few years, there has been an increasing demand from representative industrial concerns for men trained in the physical sciences and holding the Bachelor of Science degree. Men with such training are needed in purchasing, sales, personnel, and technical divisions.

Also with this increasing recognition of the place of physics and chemistry in our industrial society, there will undoubtedly come an increase of the enrollment in the subjects in secondary schools and a consequent demand for secondary school teachers in physics and chemistry. California State Polytechnic College students who successfully complete all of the requirements for a teaching major in physical science and general science will be recommended for the General Secondary Credential.

In addition to this vocational emphasis, the course in Physical Science has two additional objectives:

1. To help provide scientific explanation for courses taken by students in the Engineering and Agricultural Divisions.

2. To contribute to the general education of all students by giving them a thorough foundation in the method, factual content, and philosophic outlook of science.

It is recommended that the high school student planning a Physical Science major should include in his high school program three semesters of algebra, one of trigonometry, two of geometry, two of physics, and two of chemistry.

Before a student is admitted to General Physics, he is required to take a placement examination in mathematics and in physics. If the result of this examination indicates that he is unlikely to succeed in General Physics, it is recommended that he take Preparatory Physics and Preparatory Mathematics before taking General Physics. After one or more quarters of Preparatory Physics and Preparatory Mathematics have been successfully completed, he can then take General Physics. Students enrolling in degree chemistry are required to pass a placement test, or PSc 4 or the equivalent.

Non-degree students in the Engineering Division take Physics for Technical Students. Non-degree students in the Engineering Division and the Agricultural Division, who are required to take a course in chemistry, take Chemistry in Industry or Chemistry in Agriculture.

Degree Curriculum

The Bachelor of Science degree is granted for successful completion of the degree courses as listed in the physical science curriculum.

Graduate Work

A fifth year is offered by this department for those students who wish to advance beyond the Bachelor of Science level and for students who desire a general secondary teaching credential in physical science.

* On educational leave.

DEGREE CURRICULUM IN PHYSICAL SCIENCE

Freshman Year			
	F	W	S
English Composition (Eng 104, 105, 106)-----	3	3	3
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----		2	
Personal Development (Psy 101)-----	2		
General Physics (PSc 131, 132, 133)-----	4	4	4
Intermediate Algebra (Math 107)-----	3		
College Algebra (Math 108)-----		3	
Analytic Geometry (Math 109)-----			3
General Biology (BSc 101, 102)-----	3	3	
Public Speaking (Eng 201)-----			2
Machine Shop (ME 141, 142)-----	1	1	
Electives-----			4
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
Sophomore Year			
Principles of Economics (Ec 201, 202, 203)-----	3	3	3
Calculus (Math 201, 202, 203)-----	3	3	3
General Chemistry (PSc 321, 322, 323)-----	4	4	4
Engineering Mechanics (PSc 201)-----	3		
Sound (PSc 202)-----		3	
Light (PSc 223)-----			3
Literature-----	3	3	3
Construction of Laboratory Glassware (PSc 243)-----			1
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
	<hr/> 16 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$
Junior Year			
Differential Equations (Math 301, 302, 303)-----	2	2	2
General Psychology (Psy 202, 203)-----		3	2
Organic Chemistry (PSc 326)-----			4
Quantitative Analysis (PSc 331, 332)-----	4	4	
Heat (PSc 301)-----	3		
Advanced Electricity and Magnetism (PSc 303)-----			3
American Government (Pol Sc 301)-----	3		
Survey of U. S. History (Hist 304)-----		3	
Background of Modern Affairs (Hist 305)-----			3
Electives-----	5	4	3
	<hr/> 17	<hr/> 16	<hr/> 17
Senior Year			
State and Local Government (Pol Sc 401)-----	3		
Modern Physics (PSc 401, 402)-----	3	3	
Agricultural Biochemistry (PSc 328)-----	4		
Physical Chemistry (PSc 403)-----			3
Undergraduate Thesis (PSc 461, 462)-----	2	2	
Undergraduate Seminar (PSc 463)-----			2
Family Psychology (Psy 403)-----			3
Electives-----	5	11	9
	<hr/> 17	<hr/> 16	<hr/> 17

DESCRIPTIONS OF COURSES IN PHYSICAL SCIENCE

PSc 1, 2, 3 Preparatory Physics

(3) (3) (3)

Three one-hour lectures, fall, winter, and spring quarters, freshman year. The elements of mechanics, heat, sound, light, magnetism, and electricity. For those degree students whose background is deficient in physics and mathematics.

PSc 4 Preparatory Chemistry

(3)

Three one-hour lectures, fall quarter, freshman or sophomore year. The fundamental principles of chemistry. For those degree students whose background is deficient in chemistry and mathematics.

PSc 11, 12, 13 Physics for Technical Students

(3) (3) (3)

Three one-hour lectures, fall, winter, and spring quarters, freshman year. British engineering system of units with emphasis on industrial applications of basic principles of mechanics, heat, acoustics, illumination, magnetism, and electricity.

PSc 22, 23 Chemistry in Industry

(3) (3)

Three one-hour lectures, winter and spring quarters, freshman year. For technical students in industry. Principles and applications of elementary chemistry.

PSc 41 Chemistry in Agriculture

(3)

Three one-hour lectures, fall quarter, sophomore year. For technical students in agriculture. Principles and applications of elementary chemistry.

PSc 101, 102, 103 General Physical Science

(4) (4) (4)

Three one-hour lectures and demonstration, one recitation section, fall, winter, and spring quarters, freshman or sophomore year. For science and humanities students not majoring in mathematics or a natural science. A survey of physics, chemistry, astronomy, and geology. Emphasis on the development of a better understanding of men's physical environment and the scientific methods of working and thinking.

PSc 131, 132, 133 General Physics

(4) (4) (4)

Three one-hour lectures, one three-hour laboratory and recitation section, fall, winter, and spring quarters, freshman year. Fundamental principles of mechanics, heat, sound, light, magnetism, and electricity. Emphasis on mechanics, heat, and electricity. Admission to the course based on the student's ability to pass an elementary placement examination in mathematics and in physics.

PSc 201 Engineering Mechanics

(3)

Three one-hour lectures, fall quarter, sophomore year. General principles, equilibrium, stresses and reactions in simple structures, friction, centroids, center of gravity, moments of inertia, rectilinear motion, work, and energy.

Prerequisites: PSc 131, Math 106. Math 201 is strongly recommended.

PSc 202 Sound

(3)

Three one-hour lectures, winter quarter, sophomore year. Source, nature, refraction, reflection, transmission, diffraction, interference, absorption, intensity level and loudness level of sound.

Prerequisites: PSc 133, Math 106. Math 201 is strongly recommended.

PSc 223 Light

(3)

Two one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. Source, nature, reflection, refraction, diffraction, interference, polarization, and absorption of light.

Prerequisite: PSc 133. Math 201 is recommended.

PSc 243 Construction of Laboratory Glassware

(1)

One three-hour laboratory, spring quarter, sophomore year. Techniques of glass blowing as applied to the making of simple laboratory apparatus.

Prerequisite: PSc 321

PSc 301 Heat (3)

Three one-hour lectures, fall quarter, junior year. An introduction to kinetic theory and thermodynamics.

Prerequisites: PSc 133, Math 203

PSc 303 Advanced Electricity and Magnetism (3)

Three one-hour lectures, spring quarter, junior year. Electrostatic and magnetic fields; Gauss' Law, potential, capacitance; direct current circuits; chemical effects; thermal electricity; alternating current circuits; electronic emission.

Prerequisites: PSc 133, Math 203

PSc 321, 322, 323 General Chemistry (4) (4) (4)

Three one-hour lectures, one three-hour laboratory, fall, winter, and spring quarters, sophomore or junior year. Fundamental principles, properties of matter, the common elements and their compounds, applications of chemistry to engineering and industry. For engineering students.

Prerequisites: Successful completion of a placement test, or PSc4 or its equivalent.

PSc 324, 325 General Inorganic Chemistry (4) (4)

Three one-hour lectures, one three-hour laboratory, fall and winter quarters, sophomore or junior year. A study of the fundamental principles of chemistry and the common elements and their compounds with applications to agriculture. For agricultural students.

Prerequisites: Math 103 or equivalent; successful completion of a placement test, or PSc 4 or its equivalent.

PSc 326 Organic Chemistry (4)

Three one-hour lectures and one three-hour laboratory, spring quarter, junior year. The fundamental concepts of organic chemistry with applications to agricultural and industrial processes.

Prerequisite: PSc 322 or 325.

PSc 328 Agricultural Biochemistry (4)

Three one-hour lectures and one three-hour laboratory, winter quarter, junior year. Fundamental chemistry of carbohydrates, proteins, fats, vitamins, enzymes, and hormones as applied to their function in plant and animal metabolism. Special reference to the chemistry involved in the use, analysis, and manufacture of fertilizers, feeds, insecticides, and dairy products.

Prerequisite: PSc 326.

PSc 331, 332 Quantitative Analysis (4) (4)

Two one-hour lectures, two three-hour laboratories, fall and winter quarters, junior year. The theories and methods of volumetric and gravimetric analyses.

Prerequisite: PSc 323.

PSc 401, 402 Modern Physics (3) (3)

Three one-hour lectures, fall and winter quarters, senior year. An introduction to such topics as the nature of matter and electricity, conduction of electricity in gases, the Bohr atom, photoelectric effect, quantum theory, and radioactivity.

Prerequisites: PSc 223, PSc 323, Math 303. PSc 303 is strongly recommended.

PSc 403 Physical Chemistry (3)

Three one-hour lectures, spring quarter, senior year. The principles of chemical change, behavior of gases, reaction rates, and similar topics.

Prerequisite: PSc 323.

PSc 461, 462 Undergraduate Thesis (2) (2)

Two one-hour meetings, fall and winter quarters, senior year. Selection and development of topic, preparation of manuscript.

PSc 463 Undergraduate Seminar (2)

Two one-hour meetings, spring quarter, senior year. A discussion of periodicals of an appropriate level.

PSc 501 Selected Topics in Advanced Physics (3)

Three one-hour lectures, fall quarter, graduate year. An introduction to such topics as electromagnetic theory of radiation and the special theory of relativity.

Prerequisite: Graduate standing.

PSc 502 Nuclear Physics (3)

Three one-hour lectures, winter quarter, graduate year. Collision problems, nuclear disintegrations, nuclear models.

Prerequisite: PSc 501.

PSc 512 Philosophy of Science (3)

Three one-hour lectures, winter quarter, graduate year. An introduction to the relationship of philosophy and science, including a presentation of problems in the logic of science and in the analyses of the concepts of science.

Prerequisite: Graduate standing.

PSc 513 Advanced Inorganic Chemistry (3)

Three one-hour lectures, spring quarter, graduate year. Theories of formation and uses of selected inorganic compounds.

Prerequisite: Graduate standing.

PSc 521 Curriculum and Methods in Physical Science (3)

Three one-hour lectures, fall quarter, graduate year. The psychological approach to the teaching of physical science and general science at the secondary school level. Aims and objectives of physical science in the secondary school. Selection of material. Analyses of effective teaching techniques. Evaluation of teaching results.

Prerequisite: Graduate standing.

SOCIAL SCIENCE DEPARTMENT

Department Head, A. NORMAN CRUIKSHANKS

ROY E. ANDERSON
CARL BECK
J. PHILIP BROMLEY

RALPH W. DILTS
THOMAS NOLAN
EUGENE RITTENHOUSE

EDWARD ROGERS
MORRIS EUGENE SMITH
*JAMES S. ST. CLAIR

With increased emphasis on civic responsibility and the need to be informed on both domestic and international affairs, regardless of one's field of specialization, there is an increased demand for men trained in the social sciences. The expansion of government in the field of economics has increased possibilities for the social science major who intends to enter Civil Service. There are also continuing opportunities for the secondary school teacher of social science.

The primary objectives of the California State Polytechnic College department of Social Science are: (1) to give students of all divisions of the college a better grasp of the intricacies of human behavior and human society and the difficulties presented by a changing world; to require value judgments about current problems and give practice in bringing experience in the fields of economics, political science, sociology, and history to bear upon those problems; to familiarize students with the responsibilities of citizenship; (2) to provide social science majors with the qualifications for teaching in the secondary schools, and the background for positions in journalism, radio, advertising, social welfare, labor and public relations in industry, agriculture, and business organizations where a working knowledge of people and social institutions is required.

Degree Curriculum

A Bachelor of Science degree is offered to the major in social science who completes the curriculum outlined.

Graduate Work

A fifth year of work is offered by the social science department for those students who wish to qualify for a general secondary credential with a social science major or minor.

DEGREE CURRICULUM IN SOCIAL SCIENCE

	F	W	S
Freshman Year			
English Composition (Eng 104, 105, 106) -----	3	3	3
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----		2	
Personal Development (Psy 101) -----	2		
Intermediate Algebra (Math 107) -----	3		
College Algebra (Math 108) -----		3	
General Biology, or equivalent (BSc 101, 102, 103) -----	3	3	3
History of Civilization (Hist 101, 102, 103) -----	3	3	3
Electives -----	2	2	7
	16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
Principles of Economics (Ec 201, 202, 203) -----	3	3	3
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
General Psychology (Psy 202, 203) -----		3	2
General Physical Science (PSc 101, 102, 103), or equivalent ---	4	4	4
Contemporary Civilization (SSc 201, 202, 203) -----	3	3	3
American Government (Pol Sc 301) -----	3		
Public Speaking (Eng 201) -----			2
Electives -----	4	4	3
	17 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$

* On educational leave.

	Junior Year	F	W	S
* History of United States (Hist 301, 302, 303) -----	3	3	3	
History of Latin America (Hist 311) -----	3			
Background of Modern Affairs (Hist 305) -----	3			
International Relations (Pol Sc 312, 313) -----		3	3	
Literature -----	3	3	3	
Industrial Management (Ec 411) or Agricultural Resources (Ec 305) -----		3		
Commercial Law (Ec 316) -----				3
† Accounting (Ec 301, 302) -----	3	3		
Electives -----	2	2		3
	17	17		15
	Senior Year			
Family Psychology (Psy 403) -----		3		
History of Pacific Area (Hist 411, 412) -----	3	3		
State and Local Government (Pol Sc 401) -----				3
Undergraduate Thesis (SSc 461, 462) -----	2	2		
Undergraduate Seminar (SSc 463) -----				2
Principles of Marketing (Ec 401) -----	(3)			
or Cooperative Marketing (Ec 402) -----		(3)		
Marketing Control and Government Activity (Ec 413) -----				3
Electives -----	8	9		8
	16	17		16

DESCRIPTIONS OF COURSES IN SOCIAL SCIENCE

(Economics, History, Political Science, Social Science, Art)

Economics

Ec 41 Economic Problems (3)

Three one-hour lectures, fall quarter, sophomore year. A study of the practical business problems of the farmer. Included in this course are problems involving property ownership such as deeds, escrow procedures, and title insurance; compensation, fire, property damage, and public liability insurance; negotiable instruments; employer-employee relationship, involving housing, boarding, and recreation for hired help; safety and accident prevention; contracts and leases and banking procedures.

Ec 42 Farm Bookkeeping (3)

Three one-hour lectures, winter quarter, sophomore year. A study of the fundamental bookkeeping procedures as they relate to farm accounting. Such things as the classification of accounts, the dual nature of a business transaction, net worth and operating statements, inventories, depreciation and depreciation records, recording daily transactions, adjusting and closing accounts, and the preparation of reports are studied. Particular attention is paid to information needed for the income tax return.

Ec 43 Farm Bookkeeping (3)

Three one-hour lectures, spring quarter, sophomore year. A continuation of Ec 42. Instruction during this quarter is based on a series of farm accounting problems which involve the principles of accounting and the accounting cycle.

Prerequisite: Ec 42

Ec 73 Farm Management (3)

Three one-hour lectures, spring quarter, junior year. A study of the principles involved in the combination of the factors of production. Prices and economic trends, budgets, labor and feed records, choice and combination of enterprises, enterprise analysis, and credit are typical of the subjects covered. A term paper on a management topic is required in the course.

Prerequisites: Ec 42, Ec 43

* History 304 will not substitute for any part of this requirement.

† First course in Statistical Method (Math 211) may be substituted.

Ec 100 Agricultural Project Records

(1)

One hour lecture, each quarter, freshman year. One quarter required of freshmen in each of the Agricultural majors. A course designed to acquaint the incoming student with (1) the project system of instruction as used at the college; (2) the records needed in conducting a project and efficient methods of keeping such records; (3) the method of project analysis.

Ec 201, 202, 203 Principles of Economics

(3) (3) (3)

Three one-hour lectures; fall, winter, and spring quarters; sophomore year. Introduction to economic theory. Consideration is given to organization for production, the factors of production, namely: land, labor, capital and management, and the problems of price determination under conditions of free competition. Illustrations are drawn from the field of agriculture.

Ec 301, 302 Accounting

(3) (3)

Two one-hour lectures and one two-hour laboratory, fall and winter quarters, junior year. A study of the fundamentals of accounting with their particular application to the business of farming. Also deals with cost of production studies and their place in the accounting system.

Ec 303 Farm Management

(3)

Three one-hour lectures, spring quarter, junior year. A course in management dealing with enterprise efficiency studies and cost accounting, placing particular emphasis on the problems of the farm manager.

Ec 305 Agricultural Resources

(3)

Three one-hour lectures, winter quarter, junior year. A broad survey of the agriculture of the United States, and particularly of the State of California. Consideration is given to soil, climate, topography, institutions, population and to movement of farm products.

Ec 310 Credit and Finance

(2)

Two one-hour lectures, spring quarter, junior year. An introductory course in the study of agricultural finance. Emphasis is on the study and application of the basic principles of sound credit policies. The financing problems of the farm equipment dealers from the viewpoint of the customer, dealer, and credit institutions are studied and analyzed.

Ec 313 Industrial Economics

(3)

Three one-hour lectures, spring quarter, junior year. An introductory course in the economics of industrial management. Emphasis on developing what is considered good practice in dealing with the economic problems of specific business enterprises, on inquiring into the theories on which these practices rest, and on developing methods of analysis with which to deal more intelligently with such economic problems.

Ec 316 Commercial Law

(3)

Three one-hour lectures, spring quarter, junior year. This course covers the leading and fundamental principles of business law. Simple cases showing the actual application to business and personal transactions are considered. The subjects covered include: contracts, sales, agency, real property, negotiable instruments, insurance, mortgages, and wills.

Ec 401 Principles of Marketing Agricultural Products

(3)

Three one-hour lectures, fall quarter, senior year. A study of the nature of the problem of marketing agricultural products, the various services, sales methods employed, importance of standardization and grading, storage, market news, transportation and price quotations. Special reference is made to the distribution of California farm products.

Ec 402 Cooperative Marketing

(3)

Three one-hour lectures, winter quarter, senior year. A study of farmers' cooperative buying and selling organizations. Consideration is given to price and other objectives of cooperatives, their legal status, financial, pooling and price problems, growers' rights and duties, duties of directors, types of organizations and the place of cooperative marketing in the economic system.

Ec 403 Agricultural Prices**(3)**

Three one-hour lectures, spring quarter, senior year. A study of the major factors determining the prices of selected agricultural products. Emphasis on trends, cycles, and seasonal movements in agricultural prices, on the use of government situation reports in appraising the outlook for various commodities, and on marketing costs as a price determining factor.

Ec 411 Industrial Management**(3)**

Three one-hour lectures, fall quarter, senior year. A study of topics of immediate concern to persons who direct the work of others in business enterprises. Consideration of the organization and functioning of management in industry. Emphasis on basic principles of organization, policy formulation, and means of control. Survey of the tools and objective activities of management.

Prerequisite: Ec 313.

Ec 412 Industrial Relations**(3)**

Three one-hour lectures, winter quarter, senior year. An introduction to labor relations, personnel administration, and "human relations" in industry. Consideration of union and employer policies and organizations, and governmental regulation. Special attention devoted to employment, wage, and supervisory problems.

Prerequisites: Ec 313, 411.

Ec 413 Marketing Control and Governmental Activity**(3)**

Three one-hour lectures, spring quarter, senior year. A study of state and federal governmental activities as they affect agricultural marketing. The objectives and operations of control plans, regulatory measures, agricultural programs, and governmental service activities are considered in relation to their influence on the practices of private and cooperative marketing agencies.

History**Hist 41 American History****(2)**

Two one-hour lectures, fall quarter, sophomore year. A brief course in the history of the United States with particular emphasis on the American way of utilizing the resources of nature, people, and the cultural heritage. To give the student background for understanding and acting on today's problems.

Hist 101, 102, 103 History of Civilization**(3) (3) (3)**

Three one-hour lectures; fall, winter, and spring quarters; freshman year. A study of the development of civilization and the political, social, and economic contributions of various peoples to contemporary life.

Hist 301, 302, 303 United States History**(3) (3) (3)**

Three one-hour lectures; fall, winter, and spring quarters; junior year. From colonial beginnings to the present: the European background, sectional economics, and cultures of the colonial period; the Revolutionary War; the Constitution and early nationalism, Jeffersonian and Jacksonian democracy; expansion westward, sectional struggle and the Civil War; rise and development of modern industrialism; Western immigration; developments in labor and agriculture; overseas expansion and imperialism; the World Wars; modern American scene.

*** Hist 304 Survey of United States History****(3)**

Three one-hour lectures, fall quarter, junior year. A survey of U. S. foreign policies, the development of the United States from an agricultural to an industrial nation, America's role of leadership in world affairs, the relationship between foreign problems and domestic affairs are the topics included in this course. Much current material is included.

Prerequisite: Pol Sc 301.

* Will not substitute for any part of Hist 301, 302, 303 required of teaching majors and minors.

Hist 305 Background of Modern Affairs

(3)

Three one-hour lectures, winter quarter, junior year. An examination and exploration of the fundamental forces which are responsible for the motivation of foreign policies. Lectures, combined with assigned reading, designed to show the inter-relationships of nations economically, socially, and politically. Chief emphasis on the period since 1900. Events which led to World Wars I and II, the problems which resulted, and attempted solutions covered in this course.

Hist 311 History of Latin America

(3)

Three one-hour lectures, fall quarter, junior year. A survey of the history of the Latin American republics from the Spanish conquest to the present day, with special emphasis on Caribbean countries and their relations with the United States.

Hist 411, 412 History of the Pacific Area

(3) (3)

Three one-hour lectures, fall and winter quarters, senior year. An examination of the internal policies and international relations of the lands surrounding the Pacific Ocean, including eastern Russia, Japan, China, Dutch East Indies, Australia. Problems arising from Pacific island possessions are included.

Hist 501 Seminar in Economic History of United States

(2)

Two one-hour lectures, fall quarter, graduate year. The development of the economic structure of the United States and its influence on patterns of thought and behavior.

Hist 502 Seminar in History of Far East

(2)

Two one-hour lectures, winter quarter, graduate year. A study of the national and international affairs in the Far Eastern area. Consideration is given to the development of China and Japan, their relations with each other and with western nations, and to the colonial possessions of the various powers.

Political Science

Pol Sc 42 American Government

(3)

Three one-hour lectures, winter quarter, sophomore year. This course is designed to present the purposes and functions of the government of the United States in order that the student may prepare for effective participation in the duties and responsibilities of citizenship. Local government is briefly considered.

Pol Sc 301 American Government

(3)

Three one-hour lectures, fall quarter, junior year. Principles and problems in relation to the development, organization, and functions of the American system of government. Degree students only.

Pol Sc 312, 313 International Relations

(3) (3)

Three one-hour lectures, winter and spring quarters, junior year. A comprehensive view of the world picture. Problems of minorities, resources, and nationalism. Analysis of international organizations including both political and economic types. The problem of security involving the study of the League of Nations and the United Nations. Chief emphasis in second quarter on comparative government, including a study of the governments of the major foreign powers. Since minimum time is devoted to historical background, students registering for this course should have completed Hist 305.

Pol Sc 401 State and Local Government

(3)

Three one-hour lectures, fall quarter, senior year. How American states organized; relations of State and Nation; election machinery and politics, law enforcement and the court system. County and municipality organization is considered.

Pol Sc 503 Contemporary Problems of International Relations

(2)

Two one-hour meetings, spring quarter, graduate year. The geographic, economic, and political foundations of major powers as factors in international relations and foreign policies. An intensive study of selected international organizations.

Social Science**SSc 201, 202, 203 Contemporary Civilization****(3) (3) (3)**

Three one-hour lectures; fall, winter, and spring quarters; sophomore year. Primarily for the social science major who expects to teach in the field of the social sciences. Sources of materials and methods of sociological study. Survey of social problems and institutions. An actual project in field investigation, during which the student applies the techniques previously studied. Wide reading in the field required.

SSc 461, 462 Undergraduate Thesis**(2) (2)**

Two one-hour meetings, fall quarter, senior year. After a study of the methods of scientific thinking, the student is required to select a thesis topic for investigation and to develop the study and write the thesis under guidance.

SSc 463 Undergraduate Seminar**(2)**

Two one-hour meetings, spring quarter, senior year. Intensive study of selected social problems. Review of fields of social science.

SSc 511 Sources in Social Science**(3)**

Three one-hour lectures, fall quarter, graduate year. A study of the problems of locating and adapting authoritative source material in the social sciences to classroom situations.

SSc 521 Curriculum and Methods of Teaching Social Science**(3)**

Three hours of lecture and discussion, fall quarter, graduate year. Consideration is given to the problems which arise in teaching the social studies on the secondary school level.

Art**Art 201 Art in Everyday Living****(3)**

Three one-hour lectures; fall quarter; sophomore year. A course designed to add to the student's understanding and enjoyment of the visual arts. The basic principles of artistic expression will be approached through a study of their application in the fields of architecture, landscaping, sculpture, painting, photography, motion pictures, and such applied arts as ceramics, metal work, and weaving. The course will stress the role of the visual arts in everyday living. Much use will be made of prints, slides, and other visual aids, and field trips will be arranged to acquaint the student with the ways in which art enters into the life of an American community.

VOORHIS UNIT

CALIFORNIA STATE POLYTECHNIC COLLEGE



Top: View of the Administration Building, Library and "H" Building from the chapel tower on the Voorhis campus, San Dimas, Calif.

Bottom: All classroom, dormitory, laboratory and administrative buildings on the San Dimas campus follow the same architectural pattern as that of this Spanish-style dormitory building which blends perfectly with the park-like setting of the campus.



Top: Citrus fruit production students cultivate college citrus groves.

Center: Greenhouses at the Voorhis Unit provide room for student projects and laboratories.

Left: Field and truck crops students seed fields on the campus.

VOORHIS UNIT

**California State Polytechnic College
SAN DIMAS, CALIFORNIA**

INTRODUCTION

The Voorhis Unit of California State Polytechnic College is situated twenty miles east of Los Angeles, centered between the communities of Covina, Pomona, and San Dimas. Being just south of the Sierra Madre Mountains, it is in the heart of the vast citrus, truck crops, and commercial ornamental horticulture production areas of Southern California.

Instruction at this institution is offered in Agricultural Inspection, Citrus Fruit Production, Ornamental Horticulture, Field and Truck Crops, general agricultural subjects, and related biological, physical, and social sciences.

The same educational philosophy, pattern of courses, and requirements of the Agricultural Division of California State Polytechnic College at San Luis Obispo are followed at the Voorhis Unit. Students enrolling in the three-year technical or two-year vocational curricula may complete all requirements leading to graduation certificates in these curricula at the Voorhis Unit; however, students seeking the Bachelor of Science degree normally complete their first three years at the Voorhis Unit and transfer to the San Luis Obispo campus to complete their degree requirements.

HISTORY

The Voorhis Unit became a part of the California State Polytechnic College in 1938 when this completely-equipped school and farm near San Dimas was deeded to the college by Charles B. Voorhis of Pasadena, and his son, former Congressman Jerry Voorhis. The school had previously been conducted by Voorhis and his son as a school for young boys needing a home. This branch of the college, representing an investment of more than a million dollars, was put into operation as a citriculture, horticulture, and agricultural inspection branch of the main institution. Sixty students and nine instructors opened the school in September of that year.

The Voorhis Unit experienced a steady growth to reach an enrollment of 125 students in 1943. The Unit was closed because of war conditions in June, 1943. However, the agricultural crop production areas were operated on a commercial basis for the following three years.

In the fall of 1946, the Voorhis Unit was reopened to meet the demand of returning World War II veterans for this specialized type of agricultural education. While the opening enrollment was planned for 150 students, it was necessary to expand the services of a staff of nine instructors to meet the needs of more than 250 men.

During the spring and summer of 1947 an army surplus classroom building was erected on the campus and veteran's emergency housing was provided. These additions permitted the acceptance of another 150 students in the fall of 1948. The enrollment has had to be limited each year because of a shortage of educational facilities. An additional 50 acres of land was leased in 1948 to accommodate an enrollment of over 400 students. A faculty of 21 instructors made possible many additional offerings in general agricultural subjects, biological and physical sciences, as well as the social sciences.

In March of 1948 a report of a survey of "The Needs of California in Higher Education" was submitted to the State Legislature. This report emphasized the state-wide appeal of the California State Polytechnic College and recommended that the educational program of the Voorhis Unit be expanded to serve an anticipated enrollment of 1,000 students.

GENERAL INFORMATION

THE COLLEGE PLANT

Lands

The campus of the Voorhis Unit comprises some 157 acres with an additional 50 acres of leased land which serves as a project laboratory for truck and field crops classes.

The 800 acres now available at the nearby Kellogg Unit of the college provides practical learning opportunities for Voorhis students enrolled in ornamental horticulture, crops production, citrus fruit as well as experience in handling livestock.

The Voorhis Unit is climatically suited for specialization in citrus fruits and ornamental horticulture. Approximately thirty acres is utilized for citrus, avocados, and deciduous fruits which demonstrates the utilization of different types of land for each agricultural field.

Administration and Classroom Buildings

Campus activities are centered in the Administration group of buildings which contain administrative offices, classrooms, photographic dark room, and science laboratories. One entire wing is made available for student activities with campus store, patio, and dining halls located in this area.

The recently erected "H" building, containing approximately 10,000 square feet of floor space, provides many additional classrooms and offices. Seven faculty offices and classrooms are located in this unit which lies directly behind the administration building.

Seven beautiful stucco buildings designed in the traditional early California Mission style serve as residence halls for approximately one hundred and forty men. These dormitories are modern, well lighted and admirably arranged for student use. Each dormitory has a lounge which serves to facilitate student recreation and welfare. Each unit houses twenty to thirty students. The residence halls are: St. James, Sunset, Rose, Smith, and Uncle Charlie's and Aunt Nell's, named after the principal donor and his wife, Mr. and Mrs. Charles B. Voorhis.

In addition to these permanent dormitories, 20 Dallas huts have been erected to provide housing for approximately eighty men. These units are located at the extreme west end of the campus overlooking the heavily wooded arroyo.

Ornamental Horticulture Buildings

Two modern commercial sized glass houses, one large metal stripped lath house, and a fully equipped propagation shed provide practical learning opportunities for students majoring in ornamental horticulture.

Agricultural Mechanics Shops

The Agricultural Mechanics Shops have complete facilities for training students in mechanical skills, such as: farm machinery operations and repair, farm building construction, welding, wiring, and plumbing.

There are two main buildings given over to shop work. The first is a large two-story structure 160 feet long and 40 feet wide which serves as the center for farm power and machinery, carpentry, plumbing, and rural electric wiring projects. The second is a student constructed welding shop, equipped with seven acetylene and five arc stations.

Athletic Facilities

The athletic plant covering approximately five acres is situated at the extreme east end of the campus on a high plateau. This location affords a panoramic view of some of the most productive citrus and avocado groves of Southern California, with famous Mt. Wilson and snow-capped "Old Baldy" rising in the background. This athletic area includes facilities for track and field events, a football field, two baseball diamonds, basketball, tennis, badminton, and handball courts, portable boxing ring, and a spacious outdoor swimming pool.

Veterans' Housing

The popular "Vet Hill" housing project for married veterans and their families is located just above the beautiful swimming pool, which lies in the heart of the Voorhis campus. This unit consists of two double-story buildings and three single-floor structures equipped with all the necessary conveniences for family life. It houses a total of 44 veteran families. Twenty-eight units are combinations including one bedroom, living room, kitchenette, and bath. Sixteen are three-room units with two bedrooms, bath, living room, and kitchenette.

"Vet Hill" is now completely landscaped and equipped with electric washing machines, gas ranges, refrigerators, double and single beds, fenced play area for children and carries on many friendly social activities.

Chapel

The Voorhis Unit is fortunate in having one of the most beautiful chapels in Southern California situated on its campus. The architectural style was patterned by the donors, Charles B. Voorhis and his wife, after the old Spanish missions founded along the west coast by Padre Serra. The Voorhis built a similar chapel at Jackson Hole, Wyoming, in 1925. Both structures provide scenic views of distant mountain peaks through spacious picture windows. A two-manual pipe organ provides a rich musical background for many student and community weddings during the school year.

Campus Life and Organizations

All students are encouraged to engage in the many social and recreational activities sponsored by the college. The following clubs and organizations are designed to appeal to a variety of student interests: Block "P" Association, Dormitory Clubs, Agriculture Inspection Club, Ornamental Horticulture Club—"Los Robles," Citrus Club—"Caldimas," Crops Club—"Los Rancheros."

Student Body Government

Student body government functions under the jurisdiction of the elected student body officers and the Student Affairs Council, made up of elected representatives of the various campus organizations. All regularly enrolled students normally become members of the Associated Student Body. The membership fee is \$15 per year and entitles the student to admission to all athletic and social events. Membership also includes a subscription to the weekly paper, *Poly Views*, and the privilege of purchasing at a reduced price, the college yearbook, *Madre Tierra*.

The Cafeteria-Dormitory Committee, composed of representatives of the student body, cooperates with the college administration in the operation of the college cafeteria and the dormitories.

"Poly Vue"

"Poly Vue" is the name given to the annual open house day of the Voorhis Unit of the California State Polytechnic College. It is designed to show parents and friends the yearly activities and progress of the institution as well as to provide a time for friendly social activities.

Each year a coeducational college in the area is selected by the Voorhis student body to provide a court to serve the queen who reigns over "Poly Vue."

Publications

Poly Views is the official publication of the Associated Students of the Voorhis campus and is published weekly during the school year.

Madre Tierra is the yearbook record of student activities carried on during the year on the Voorhis campus.

Health and Medical Service

All students are required to pay a medical fee of \$3 per quarter which provides the student with medical service at a clinic in a nearby community. The service covers costs for treatment by a physician for colds, digestive troubles, chronic diseases, infectious diseases, minor surgery, setting of broken bones, and first aid. It does not include hospitalization, major surgery, or X-ray.

Campus Employment and Placement

Campus employment opportunities are handled by instructors in the various departments and those charged with campus maintenance. Off-campus employment opportunities are handled by faculty members of the three major departments. This arrangement is practical because these faculty members are constantly in touch with farmers and commercial people serving in the fields in which the students are receiving training.

The services of the placement office on the San Luis Obispo campus are available to graduates and transfers from the Voorhis Unit. However, staff members of each of the three departments carry the major responsibility for the placement of men who have had all or part of their instruction at the Voorhis Unit.

Athletics

Intercollegiate competition in basketball and baseball was first carried on during the 1946-47 school year. The next fall the first football team was fielded. That same year teams representing the college participated in intercollegiate tennis and track competition.

Most of the intercollegiate competition at the Voorhis Unit has been with junior college and college teams in the Southern California area. Being a branch of a four-year college, yet with most of the students in their first two or three years of work, it has been impossible to join a conference. Competition has been maintained in football, basketball, track, baseball, tennis, and golf.

A "V" in the center of the block "CP" athletic award, presented at the Voorhis Unit, distinguishes it from the one won by athletes on the San Luis Obispo campus.

An extensive intramural program based upon voluntary participation is maintained as an integral part of the curriculum in physical education. Sports such as touch football, basketball, volleyball, and softball have been organized around the dormitories. Individual sports such as tennis, badminton, horseshoes, track and field events, swimming, handball, boxing, and wrestling have been organized around four departmental clubs: Agricultural Inspection, Los Robles, Caldimas, and Los Rancheros. An elaborate point system has been devised to stimulate competition in the various intramural activities.

The Department of Health and Physical Education offers activities designed to provide a sound program of recreation, education in physical skills, and the give-and-take games. Training in these fields is provided through regular physical education classes. Health instruction is given all freshmen through a two-unit course in hygiene. A medical examination is required of all entering students.

AGRICULTURAL PROJECT FACILITIES

Because of the nature of the enterprises in the plant field, the student work is largely concentrated in group projects—that is, the fruit production students handle the entire citrus grove as a unit. The cultivation, irrigation, and survey work is done entirely by the students in addition to a major portion of the harvesting and pest control. The same procedure is followed by students majoring in ornamental horticulture and agricultural inspection work on various other areas of school property.

Project facilities include 11 acres of bearing navel and valencia oranges, three acres of eureka and lisbon lemons and three acres of fuerte avocados, available for student practice work and management. The school is located in a thermal belt, making it possible to find ample field practice in deciduous fruit production from the campus planting and in neighboring orchards.

In addition to the fruit acreage, approximately 50 acres are in use for vegetable and field crop production. This makes many opportunities for students to secure practical experiences in planting, growing, harvesting, and pest control on a commercial basis.

Advanced students are encouraged to secure part time employment closely related to the field of their major interest such as: Many students work at orchard mapping and grading, tree treatment, pruning, orchard heating, nursery work, landscaping, and grounds maintenance. Many ranches and estates near the college call upon students for this type of work.

Climatic conditions at the Voorhis Unit, which make it admirably suited for fruit production, are equally advantageous in the ornamental horticulture field. The Voorhis campus has ample propagation facilities for nursery work and affords extensive opportunity for supervised gardening and for field trips to major propagation areas.

Complete facilities are provided for training men in the common practices and skills as well as the essential techniques in agricultural inspection. Equipment includes that used in fruit testing; plant, insect and disease specimens of importance in the major fruit and crops production areas of California, as well as laboratory samples and specimens of diseases and pests which might be introduced from other states and nations; laboratory equipment and microscopic analysis; a small apiary for all types of bee work; farm equipment and supplies used in weed and rodent control; a completely equipped soils laboratory; and a complete library of related information covering all subjects taught. Pest control equipment and material are available. The curricula were established after each course and combination had received the approval of the State Department of Agriculture for its effectiveness in training inspectors.

In addition to the inspection facilities on the campus, the whole State serves as a training ground. Many sophomores and junior students secure temporary summer employment in the inspection and pest control fields. Field trips are made to nearby shipping points and picking and propagation districts.

ADMISSION, REGISTRATION, AND GRADUATION

Admission requirements, registration procedure, admission with advanced standing, credit by special examination, scholarships, loan funds, general graduation requirements, graduation requirements for the Agricultural Division, and teacher credential requirements are the same for the Voorhis Unit as for the San Luis Obispo campus of the college. Complete information on these subjects will be found under the ADMISSION, REGISTRATION, AND GRADUATION sections of this catalog.

FEES AND DEPOSITS

State Fees and Deposits

Laboratory and Course Fees (quarter)	\$6.00
Breakage Deposit (year)	10.00
(All deposits refunded at end of year if there are no charges against student)	
Late Registration Fee	2.00
Late Return of Registration Cards Fee	2.00
Transcript Fee (no charge for first copy)	1.00
Evaluation of Record Fee	2.00
Course Challenge by Special Examination Fee (per unit)	1.00
Extension Course Fee (per unit)	\$1.00 or 5.00
Change of Program Fee	1.00
Failure to Meet Administratively Required Appointment	2.00

Other Fees and Deposits

* Subsistence Deposit (all students, year)	\$10.00
(Unused portion refundable when student leaves school)	
Associated Student Membership Fee (per year)	15.00
Medical Fee (per quarter)	3.00
Graduation Fee	7.50
(Must be paid at time application for graduation is submitted)	

NOTE: Fees for the summer quarter are identical to the fees for the other quarters.

LIVING EXPENSES

Room, per month (subject to change)	\$9.00
(Must be paid quarterly in advance; students are required to furnish bed linen and blankets)	
Board, per month (subject to change)	40.00
(Must be paid in advance)	

Example of what the average student, not enrolled under Public Law 16, 346, or the California Veterans Educational Act, pays at the time of registration:

Subsistence Deposit	\$10.00
Breakage Deposit	10.00
Associated Student Membership Fee (per year)	15.00
Medical Fee (per quarter)	3.00
Laboratory and Course Fee	6.00
Room Rent (per quarter)	27.00
Board (per month)	40.00
Books and Supplies (estimated)	30.00

\$141.00

* All applications for admission must be accompanied by a \$10.00 subsistence deposit.

Example of what the average student enrolled under Public Law 16, 346, or the California Educational Act, pays at time of registration:

Subsistence Deposit	\$10.00
Room Rent (per quarter)	27.00
Board (per month)	40.00
* Books and Supplies	---
	<hr/>
	\$77.00

FAMILY HOUSING

† Rental Charge on Apartments:

- 1-Bedroom Apartments, furnished, including utilities-- \$30.00 (per month)
- 2-Bedroom Apartments, furnished, including utilities-- 35.00 (per month)

REGULATIONS

The following regulations apply to students at the Voorhis Unit in the same manner as to students on the San Luis Obispo campus: Change of Curricula; Change of Program; Class Attendance; Grading System; Minimum Grade Requirements; Personal Conduct; Maximum and Minimum Load, credit for Military Service. (See front of this catalog on General Information.)

Eligibility for Intercollegiate Athletics

All students regularly enrolled at the Voorhis Unit are eligible to participate on the athletic teams, providing they meet the following rules set up by the Athletic Board.

1. Competition is open to regularly enrolled students currently carrying at least 12 units and passing in at least 10 units.
2. Students must have passed in 10 or more units and earned at least five grade points during the last quarter or semester of any college attendance.
3. A certified student must be an amateur sportsman who is engaged in sports for the physical, mental, or social benefits he derives therefrom, and to whom the sport is an avocation. According to the National Collegiate Athletic Association's interpretation any athlete who takes or is promised pay in any form for participation in athletics does not meet this definition of an amateur.
4. Freshmen, Junior college transfers, and transfer students from four-year colleges are immediately eligible if previous credits satisfy requirements of eligibility.

Administration of these regulations are carried out by a faculty committee which makes checks bimonthly on the eligibility of students participating in extra-curricular activities.

Cafeteria

All single students who live on the campus must purchase one of three kinds of meal tickets: (1) long-week meal ticket, (2) short-week meal ticket, (3) coupon book.

* If trainees have a Veterans Administration Letter of Entitlement when they register, books and supplies will be furnished. If they do not have the Letter of Entitlement, the trainee must pay for all fees, books and supplies until the time the letter is presented. There will be a refund made to the veteran when the letter is presented.

† Includes electricity, gas, and water.

AGRICULTURAL INSPECTION DEPARTMENT

EDWARD C. APPEL, JR.
KENNETH HOBBS

JOHN F. LAMIMAN
* WILLIAM R. TROUTNER

Agricultural Inspection is a relatively new and expanding profession. The agricultural inspector is a cooperative agent, whose duties are to enforce California's agricultural laws and regulations which have been set up for the protection of and assistance to agricultural enterprises.

The protection of California's agricultural industry from the many plant and animal pests requires the services of many inspectors throughout the State. The fruit and vegetable grading, packing, processing and marketing industries employ many individuals with specialized training.

Temporary summer appointments after the completion of one or two years of training in this major allows the students to secure valuable and necessary supervised experience in their chosen field.

Facilities

The Voorhis Unit of the California State Polytechnic College, at San Dimas, is ideally located to train men in agricultural inspection, and has adequate equipment and plantings, while the Los Angeles fruit and vegetable markets are the second largest in the United States. The agricultural inspection field is highly developed in the southern counties, and the institution is situated in the center of California's great citrus production area.

Degree Curriculum

Completion of the degree curriculum provides graduates with Bachelor of Science degrees in Agriculture with a major in Agricultural Inspection. The degree plus experience is fast becoming a prerequisite to permanent appointment and advancement.

Civil service competitive examinations are open regularly to individuals possessing satisfactory training and experience.

Technical Curriculum

Technical certificates are provided to those students who meet the graduation requirements under the three-year technical curricula. All requirements for these technical certificates may be met at the Voorhis Unit.

Vocational Curriculum

A two-year vocational curriculum is offered in the field of Agricultural Inspection. This curriculum has been developed to provide a maximum amount of training in major courses in agricultural inspection in a minimum amount of time. This curriculum may be completed in full only at the Voorhis Unit.

Placement

Fields of employment open to the agricultural inspection graduates are almost identical for the two curricula. Many of the positions in this field that offer the greatest advancement, however, are open only to the graduate with the Bachelor of Science degree.

Fields of employment open to the agricultural inspector in either county, state, or federal work include: Quarantine, Pest Control, Apiary, Inspection, Standardization, Weed and Rodent Control, Shipping Point Inspection, Plant Pest Survey, and Nursery Inspection.

Many opportunities for like activities are also found in private industries.

* At San Luis Obispo.

DEGREE CURRICULUM IN AGRICULTURAL INSPECTION—VOORHIS UNIT

Freshman Year	F	W	S
English Composition (Eng 104, 105, 106) -----	3	3	3
Mathematics (Math 102, 103) -----		2	3
Agricultural Mechanics (AE 121, 122, or 123) -----	2		
Health and Hygiene (PE 107) -----		2	
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Ag. Law and Procedure (AgI 101) -----	3		
Entomology (BSc 126) -----	4		
Botany (BSc 121, 122) -----		4	4
Electives in Major Production Courses (with the approval of Major Adviser) -----	4	4	4
Electives -----		1	2
	16 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
Principles of Economics (Ec 201, 202) -----	3	3	
Pest Control Equipment (AE 233) -----			2
Soils (SS 221) -----	4		
Pest Control Materials (AgI 231) -----		4	
General Plant Pathology (BSc 223) -----		4	
Public Speaking (Eng 201) -----		2	
Plant Identification (AgI 224) -----	4		
Economic Insect Pests (AgI 228, 229) -----		3	3
Weed Control (AgI 226) -----			3
Rodent Control (AgI 223) -----			3
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Electives -----	5	1	5
	16 $\frac{1}{2}$	17 $\frac{1}{2}$	16 $\frac{1}{2}$
Junior Year			
Accounting (Ec 301, 302) -----		3	3
* Farm Management (Ec 303) -----			3
General Inorgan. Chem. (PSc 324, 325) -----	4	4	
Organic Chemistry (PSc 326) -----			4
American Government (Pol Sc 301) -----	3		
Survey of U. S. History (Hist 304) -----			3
† Plant Pathology -----	3		
Standardization (AgI 321) -----	4		
Plant Quarantine (AgI 322) -----		4	
Shipping Point Inspection (AgI 325) -----		3	
Agricultural Inspection Problems (AgI 372, 373) -----		1	1
Genetics (BSc 303) -----	3		
Electives -----		2	2
	17	17	16
Senior Year (San Luis Obispo)			
* Principles of Marketing (Ec 401) -----	3		
* Cooperative Marketing (Ec 402) -----		3	
Agricultural Prices (Ec 403) -----			3
Agricultural Biochemistry (PSc 328) -----		4	
State and Local Government (Pol Sc 401) -----	3		
Family Psychology (Psy 403) -----			3
Undergraduate Thesis (AgI 461, 462) -----	2	2	
Undergraduate Seminar (AgI 463) -----			2
Electives -----	8	8	9
	16	17	17

* Three units of agricultural economics to be selected from the courses listed.

† To be selected from one of applied pathology courses in a plant science field, with approval of major adviser.

TECHNICAL CURRICULUM IN AGRICULTURAL INSPECTION

Freshman Year			
	F	W	S
Technical English (Eng 11, 12, 13)-----	3	3	3
Agricultural Mathematics (Math 15)-----		3	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2
Agricultural Law and Procedure (AgI 101)-----	3		
Plant Biology (BSc 14, 15)-----		3	3
Agricultural Mechanics (AE 121 or 122 or 123)-----			2
Insect Biology (BSc 17)-----	3		
Electives in Major Production Courses (with the approval of Major Adviser)-----	4	4	4
Electives-----	3	3	2
	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>
Sophomore Year			
Economic Problems (Ec 41)-----	3		
Farm Bookkeeping (Ec 42, 43)-----		3	3
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Practical Plant Pathology (BSc 71)-----		4	
Pest Control Materials (AgI 231)-----		4	
Introduction to Soils (SS 41)-----	4		
Chemistry (PSc 41)-----	3		
American Government (Pol Sc 42)-----			3
Rodent Control (AgI 223)-----			3
Economic Insect Pests (AgI 228, 229)-----		3	3
Weed Control (AgI 226)-----			3
Pest Control Equipment (AE 233)-----			2
Electives-----	6	2	
	<u>16$\frac{1}{2}$</u>	<u>16$\frac{1}{2}$</u>	<u>17$\frac{1}{2}$</u>
Junior Year			
Plant Identification (AgI 224)-----	4		
Plant Quarantine (AgI 322)-----		4	
Farm Management (Ec 73)-----			3
Standardization (AgI 321)-----	4		
Shipping Point Inspection (AgI 325)-----		3	
Fertilizers and Fertilizer Practices (SS 72)-----		4	
American History (Hist 41)-----	2		
Agricultural Inspection Problems (AgI 372, 373)-----		1	1
Electives-----	6	5	13
	<u>16</u>	<u>17</u>	<u>17</u>

VOCATIONAL CURRICULUM IN AGRICULTURAL INSPECTION

The first two years of the technical curriculum comprise the two-year vocational curriculum in Agricultural Inspection.

DESCRIPTIONS OF COURSES IN AGRICULTURAL INSPECTION**Ag I 101 Agricultural Law and Procedure (3)**

Three one-hour lectures, fall quarter, freshman year. A basic course for agricultural inspection students. Fundamental law and the Agricultural Code as it affects the agricultural inspector. Presents background of law for other agricultural inspection courses.

Ag I 223 Rodent Control (3)

Two one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. A study of the injurious, small mammals, stressing the identification, life histories, economic importance, and the various methods and materials used in their control. Related laws and regulations.

Prerequisite: Ag I 101

Ag I 224 Plant Identification

(4)

Three one-hour lectures, one three-hour laboratory, fall quarter, sophomore year. A survey in plant materials covering trees, shrubs, vines and bedding plants commonly grown in California. Identification of plants and of serious diseases and insect pests.

Prerequisites: BSc 122 or BSc 15, BSc 126 or BSc 17

Ag I 226 Weed Control

(3)

Two one-hour lectures, one three-hour laboratory, spring quarter, junior year. The identification of weeds and weed seeds, methods of control and materials used, collection and preservation of specimens. Related laws and regulations.

Prerequisites: Ag I 101, BSc 121, BSc 122 or BSc 14, BSc 15

Ag I 228 Economic Insect Pests

(3)

Two one-hour lectures, one three-hour laboratory, winter quarter, freshman year. A survey of the insect pests attacking agricultural crops, with emphasis on life histories, host plants, nature of damage, distribution, and control methods.

Prerequisite: BSc 126 or BSc 17.

Ag I 229 Economic Insect Pests

(3)

Two one-hour lectures, one three-hour laboratory, spring quarter, freshman year. A continuation of Ag I 122.

Prerequisites: BSc 126 or BSc 17, Ag I 122.

Ag I 231 Pest Control Materials

(3)

Two one-hour lectures, one three-hour laboratory, winter quarter, sophomore year. A study of the principles and practices of general pest control, with special emphasis on the composition, properties, preparation, and application of common pest control materials.

Prerequisites: BSc 126 or BSc 17, Ag I 122, Ag I 123

Ag I 321 Standardization

(4)

Three one-hour lectures, one three-hour laboratory, fall quarter, sophomore year. A course dealing with the standardization provisions of the Agricultural Code relating to fruits, nuts, vegetables, eggs, and honey.

Prerequisites: Ag I 101, BSc 223 or BSc 71

Ag I 322 Plant Quarantine

(4)

Three one-hour lectures, one three-hour laboratory, winter quarter, junior year. A study of state and federal quarantine laws and regulations. Identification, life histories, and hosts of insects and diseases against which quarantines are enforced.

Prerequisites: Ag I 101, BSc 126 or BSc 17, BSc 223 or BSc 71

Ag I 325 Shipping Point Inspection

(3)

Two one-hour lectures, one three-hour laboratory, winter quarter, sophomore year. This course is designed to train students for civil service positions related to the certification of the more important fruits and vegetables. A student should plan on traveling expenses during the quarter of at least \$10.

Prerequisite: Ag I 321

Ag I 336 Apiculture

(3)

Two one-hour lectures, one three-hour laboratory, spring quarter, junior year. A practical course dealing with the habits, life history, and diseases of the honey bee, the management of bees for honey production and for pollinization purposes. Laws of importance to the beekeeper.

Prerequisite: BSc 126 or BSc 17

Ag I 372, 373 Agricultural Inspection Problems

(1) (1)

One hour lecture, winter and spring quarters, junior year. Current problems common to the agricultural inspection field will be covered. The prime function of this course is to make it possible for junior agricultural inspection students to get together and discuss mutual problems of both inspection and placement.

Ag I 461, 462 Undergraduate Thesis**(2) (2)**

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the material, and preparation of the manuscript.

Ag I 463 Undergraduate Seminar**(2)**

Two one-hour meetings, spring quarter, senior year. New methods and developments, practices, and procedures in the field.

CITRUS FRUIT PRODUCTION DEPARTMENT

ALBERT E. CANHAM

GEORGE D. PETERS

Because of the tremendous value of the fruit industry in California, there is a constant demand for the services of well-trained men in its various activities. The curricula in citrus fruit production are offered to meet this need. The educational program is approached from a very practical point of view capitalizing on the college's location in the heart of one of the greatest citrus growing empires in the world. Training is concentrated on the production, marketing and handling of fruits.

Facilities

The San Dimas campus of the Voorhis Unit has ample facilities for teaching fruit production on a practical basis. The college-owned groves and orchards are operated primarily by students as a part of their instructional program. The college owns and operates 11 acres of oranges, three acres of lemons and approximately seven acres of avocados. Various irrigation methods are employed on the campus in connection with fruit production.

Farm equipment including tractors, tillage implements, spray rigs, and fumigation equipment is owned, maintained and operated on the campus farm. A small nursery of citrus and avocado is operated to give instruction in the problems of propagation and raising of trees.

Degree Curriculum

A four-year curriculum leading to a Bachelor of Science degree in agriculture with a major in Citrus Fruit Production is offered. All students concentrating in citrus fruit production are provided the greater part of their major work at the Voorhis Unit. The pattern followed under the degree curriculum requires that students spend their freshman, sophomore, and junior years at the Voorhis Unit and their senior year at the San Luis Obispo campus.

Technical Curriculum

The three-year technical curriculum leading to the technical certificate may be completed at the Voorhis Unit. This curriculum includes a program concentrating on work and courses in the major field with work in the related field limited to essentials.

Vocational Curriculum

The two-year vocational curriculum in citrus fruit production must be completed at the Voorhis Unit. This curriculum is identical to the first two years of the technical curriculum and has been designed to include the greatest amount of work under the major in the short two-year period.

Placement

The degree curriculum in citrus fruit production trains students primarily as orchard operators and managers and for positions in related industry requiring an equivalent amount of training.

Technical and vocational curricula were developed to prepare men for return to their own farms and for active operation of citrus fruit production, processing and marketing industries.

DEGREE CURRICULUM IN CITRUS FRUIT PRODUCTION—VOORHIS UNIT

	Freshman Year	F	W	S
English Composition (Eng 104, 105, 106) -----		3	3	3
Mathematics (Math 102, 103) -----			2	3
Farm Tractors (AE 241) -----		2		
Agricultural Mechanics (AE 121, 122, 123) -----		2	2	2
Physical Education (PE 141, 142, 143) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----		2		
Botany (BSc 121, 122) -----		4	4	
Entomology (BSc 126) -----				4
Citrus Fruit Production (CF 121, 122, 123) -----		4	4	4
		17 $\frac{1}{2}$	15 $\frac{1}{2}$	16 $\frac{1}{2}$
	Sophomore Year			
Principles of Economics (Econ 201, 202) -----		3	3	
General Plant Pathology (BSc 223) -----		4		
Farm Surveying (AE 131) -----		2		
Farm Power (AE 227) -----			2	
Farm Machinery (AE 221) -----				2
Soils (SS 221) -----			4	
Soil Management (SS 222) -----				4
Public Speaking (Eng 201) -----		2		
Physical Education (PE 241, 242, 243) -----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Citrus Pest Control (CF 221) -----		4		
Avocado Production (CF 222) -----			4	
¹ Citrus Diseases (CF 223) -----				4
Electives -----		1	4	6
		16 $\frac{1}{2}$	17 $\frac{1}{2}$	16 $\frac{1}{2}$
	Junior Year			
Accounting (Econ 301, 302) -----		3	3	
² Farm Management (Econ 303) -----				3
General Inorganic Chemistry (PSc 324, 325) -----		4	4	
Organic Chemistry (PSc 326) -----				4
American Government (Pol Sc 301) -----		3		
Survey of U. S. History (Hist 304) -----				3
Fertilizers and Fertilizer Practices (SS 322) -----				4
² Citrus and Avocado Marketing (CF 301) -----			3	
Packing House Management (CF 322) -----		4		
Citrus and Avocado Orchard Management (CF 323) -----				4
Genetics (BSc 303) -----		3		
Electives -----			5	
		17	15	18
	Senior Year (San Luis Obispo)			
³ Principles of Marketing (Econ 401) -----		3		
Agricultural Prices (Econ 403) -----				3
Agricultural Biochemistry (PSc 328) -----			4	
Family Psychology (Psy 403) -----				3
⁴ State and Local Government (Pol Sc 401) -----		3		
Undergraduate Thesis (CF 461, 462) -----		2	2	
Undergraduate Seminar (CF 463) -----				2
Electives -----		9	10	9
		17	16	17

¹ Course meets Plant Pathology requirement.² Substitutes for Ec 402—Cooperative Marketing.³ Three units of agricultural economics to be selected from courses listed.⁴ Background of Modern Affairs (Hist 305) may be substituted.

VOCATIONAL CURRICULUM IN CITRUS FRUIT PRODUCTION—VOORHIS UNIT

The first two years of the technical curriculum comprise the two-year vocational curriculum in Citrus Fruit Production.

TECHNICAL CURRICULUM IN CITRUS FRUIT PRODUCTION—VOORHIS UNIT

	Freshman Year	F	W	S
Technical English (Eng 11, 12, 13)-----		3	3	3
Agricultural Mathematics (Math 15)-----			3	
Physical Education (PE 141, 142, 143)-----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----				2
Plant Biology (BSc 14, 15)-----		3	3	
Insect Biology (BSc 17)-----				3
Farm Tractors (AE 241)-----		2		
Agricultural Mechanics (AE 121, 122, 123)-----		2	2	2
Citrus Fruit Production (CF 121, 122, 123)-----		4	4	4
Electives -----		2	2	2
		<hr/> 16 $\frac{1}{2}$	<hr/> 17 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
	Sophomore Year			
Economic Problems (Ec 41)-----		3		
Farm Bookkeeping (Ec 42, 43)-----			3	3
Physical Education (PE 241, 242, 243)-----		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Farm Surveying (AE 131)-----		2		
Farm Power (AE 227)-----			2	
Farm Machinery (AE 221)-----				2
Soils (SS 41)-----		4		
Citrus Pest Control (CF 221)-----		4		
Avocado Production (CF 232)-----			4	
Citrus and Avocado Orchard Management (CF 323)-----				4
Chemistry (PSc 41)-----				3
American Government (Pol Sc 42)-----				3
Practical Plant Pathology (BSc 71)-----			4	
Electives -----		4	2	1
		<hr/> 17 $\frac{1}{2}$	<hr/> 15 $\frac{1}{2}$	<hr/> 16 $\frac{1}{2}$
	Junior Year			
American History (Hist 41)-----		2		
Farm Management (Ec 73)-----				3
Citrus and Avocado Marketing (CF 301)-----			3	
Packing House Management (CF 322)-----		4		
Citrus Diseases (CF 223)-----				4
Fertilizers and Fertilizer Practices (SS 72)-----			4	
Electives -----		11	10	9
		<hr/> 17	<hr/> 17	<hr/> 16

DESCRIPTIONS OF COURSES IN CITRUS AND AVOCADO PRODUCTION

CF 121 Citrus Production (4)

Three one-hour lectures, one three-hour laboratory, fall quarter, freshman year. A study of orchard operation skills to acquaint the student with the methods of operating commercial orchards, with emphasis on origin and distribution of citrus, varieties, economic importance, pest control, moisture relations and irrigation.

CF 122 Citrus Production (4)

Three one-hour lectures, one three-hour laboratory, winter quarter, freshman year. A continuation of CF 121 with emphasis on orchard heating, citrus nutrition and fertilization, pruning and citrus diseases.

CF 123 Citrus Production**(4)**

Three one-hour lectures, one three-hour laboratory, spring quarter, freshman year. A continuation of CF 122 with emphasis on orchard tillage practices, bud selection, root stocks, nursery practices, planting and care of young trees, and wind protection.

CF 221 Citrus Pest Control**(4)**

Three one-hour lectures, one three-hour laboratory, fall quarter, sophomore year. An advanced course stressing the recognition of citrus pests, their seasonal habits, and the latest methods and materials used in the control of these pests.

Prerequisites: BSc 122 or BSc 15, and CF 121, CF 122, CF 123

CF 222 Avocado Production**(4)**

Three one-hour lectures, one three-hour laboratory, winter quarter, sophomore year. Deals with the complete culture of the avocado, including its origin, major varieties, climatic tolerances, irrigation, fertilization, soil management, propagation, pests, and diseases. There will be at least one off-campus trip to a major avocado producing area.

Prerequisite: BSc 122 or BSc 15

CF 223 Citrus Diseases**(4)**

Three one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. An advanced course in the diseases of citrus species, and the methods and materials used in their prevention and control.

Prerequisites: BSc 223 or BSc 71 and CF 121, CF 122, CF 123

CF 236 Subtropical Fruit Propagation**(2)**

One one-hour lecture, one three-hour laboratory, spring quarter, sophomore year. The development of skills in the propagation of citrus, avocados, and certain other subtropical plants, including seed propagation, budding, grafting, and nursery practices.

Prerequisite: BSc 122 or BSc 15

CF 301 Citrus and Avocado Marketing**(3)**

Three one-hour lectures, winter quarter, junior year. A course dealing with the methods used in marketing citrus and avocados, including cooperative and other agencies, private and auction sales, advertising and marketing costs.

Prerequisites: CF 121, CF 122, CF 123

CF 322 Packing House Management**(4)**

Three one-hour lectures, one three-hour laboratory, fall quarter, junior year. A study of the management of a packing house in relation to harvesting, storage and packing, pooling systems, prorates, labor, and grower relations. A portion of this course will be devoted to the by-products of citrus and avocados.

Prerequisites: CF 121, CF 122, CF 123

CF 323 Citrus and Avocado Orchard Management**(4)**

Three one-hour lectures, one three-hour laboratory, spring quarter, junior year. A critical study of the management practices in relation to production efficiency, including production costs, labor relations, orchard analysis, etc.

Prerequisites: CF 121, CF 122, CF 123, CF 222

CF 461, 462 Undergraduate Thesis**(2) (2)**

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis—selection of the problem, collection of data, organization of the materials, and preparation of the manuscript.

CF 463 Undergraduate Seminar**(2)**

Two one-hour meetings, spring quarter, senior year. Intensive study of problems in the citrus field.

GENERAL CROPS DEPARTMENT

VOORHIS UNIT

ROBERT L. PROCSAL

Vegetable and field crop production in the Southern California counties has developed into a major industry and now ranks high with other important agricultural enterprises. The California State Polytechnic College, Voorhis Unit, offers training in these fields on a campus with soil and climatic conditions typical of much of Southern California. The Voorhis Unit is conveniently located near the Los Angeles fruit and vegetable market which is one of the largest in the world.

The primary function of this department is to prepare students for commercial production in the Vegetable, Field and Fruit Crop industries. Students may select a major in either General Crops or Deciduous Fruit Production and will carry on supervised practice in production methods while maintaining and operating the College Farm.

The type of training offered will not only prepare students for specific enterprise production but will also qualify them for positions in certain allied fields, including farm managers, positions within the fertilizer and pest control industries, marketing and processing specialists, field representatives and positions with the State and Federal Governments.

Facilities

The Voorhis campus has facilities for teaching Crop and Deciduous Fruit Production on a practical basis. College-owned and leased crop land comprises approximately 60 acres, all of which is operated primarily by students as a part of their instructional program. Smaller acreages are devoted to deciduous fruit production; primarily walnuts, peaches, and plums.

College-owned farm equipment is adequate to carry on modern commercial production in these fields and includes various makes of tractors, tillage implements, fertilizing equipment and pest control machinery.

Degree Curriculum

A four-year curriculum leading to a Bachelor of Science degree in agriculture with a major in General Crops Production is offered. Students interested in this program will take three years of their work at San Dimas and a fourth year at San Luis Obispo. All of the production courses in this major will be offered at the Voorhis Unit.

Technical Curriculum

The three-year technical curriculum leading to the Technical Certificate, may be completed at the Voorhis Unit. This curriculum includes a program concentrated on practical production courses in the major field with work in the related fields limited to essentials.

Vocational Curriculum

The two-year vocational curriculum in General Crops Production must be completed at the Voorhis Unit. This curriculum is identical to the first two years of the technical curriculum.

DEGREE CURRICULUM IN GENERAL CROPS PRODUCTION, VOORHIS UNIT

Freshman Year		F	W	S
English (Eng 104, 105, 106)-----		3	3	3
Mathematics (Math 102, 103)-----			2	3
Agricultural Mechanics (AE 121, 122, 123)-----	2	2	2	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	
Health and Hygiene (PE 107)-----			2	
Botany (BSc 121, 122)-----	4	4		
Entomology (BSc 126)-----				4
Farm Tractors (AE 241)-----	2			
Cereal Crops (CP 131)-----	4			
Field Crops (CP 132)-----			4	
Weeds and Weed Control (CP 133)-----				4
	15 $\frac{1}{2}$	17 $\frac{1}{2}$	16 $\frac{1}{2}$	
Sophomore Year				
Principles of Economics (Ec 201, 202)-----	3	3		
Public Speaking (Eng 201)-----				2
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	
General Plant Pathology (BSc 223)-----		4		
Farm Surveying (AE 131)-----	2			
Farm Power (AE 227)-----		2		
Farm Machinery (AE 221)-----				2
Soils (SS 221)-----		4		
Soils Management (SS 222)-----				4
Vegetable Crop Production (TC 224, 226)-----	4			4
Harvesting and Marketing Vegetables (TC 225)-----		4		
Electives-----	6			5
	15 $\frac{1}{2}$	17 $\frac{1}{2}$	17 $\frac{1}{2}$	
Junior Year				
Accounting (Ec 301, 302)-----	3	3		
* Farm Management (Ec 303)-----				3
General Inorganic Chemistry (PSc 324, 325)-----	4	4		
Organic Chemistry (PSc 326)-----				4
American Government (Pol Sc 301)-----	3			
Survey of U. S. History (Hist 304)-----				3
† Crop Pests and Diseases (CP 321)-----	4			
Fertilizers and Fertilizer Practices (SS 322)-----				4
Irrigated Pastures (CP 333)-----				4
Crop Farm Operation (CP 337)-----		3		
Genetics (BSc 303)-----	3			
Electives-----		6		
	17	16	18	
Senior Year (San Luis Obispo)				
* Principles of Marketing (Ec 401)-----	3			
* Cooperative Marketing (Ec 402)-----		3		
Agricultural Prices (Ec 403)-----				3
Agricultural Biochemistry (PSc 328)-----		4		
Plant Breeding (CP 304)-----				3
Family Psychology (Psy 403)-----				3
‡ State and Local Government (Pol Sc 401)-----				3
Undergraduate Thesis (CP 461, 462)-----	2	2		
Undergraduate Seminar (CP 463)-----				2
Electives-----	12	7		2
	17	16	16	

* Three units of agricultural economics to be selected from the courses listed.

† Course meets Plant Pathology requirement.

‡ Background of Modern Affairs (Pol Sc 401) may be substituted.

TECHNICAL CURRICULUM IN CROPS PRODUCTION

Freshman Year			
	F	W	S
Technical English (Eng 11, 12, 13)-----	3	3	3
Agricultural Mechanics (AE 121, 122, 123)-----	2	2	2
Agricultural Mathematics (Math 15)-----		3	
Physical Education (PE 141, 142, 143)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)-----			2
Plant Biology (BSc 14, 15)-----	3	3	
Insect Biology (BSc 17)-----			3
Farm Tractors (AE 241)-----	2		
Cereal Crops (CP 131)-----	4		
Field Crops (CP 132)-----		4	
Weeds and Weed Control (CP 133)-----			4
Electives -----	2	2	2
	16 $\frac{1}{2}$	17 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
Economic Problems (Ec 41)-----	3		
Farm Bookkeeping (Ec 42, 43)-----		3	3
American Government (Pol Sc 42)-----			3
Physical Education (PE 241, 242, 243)-----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Soils (SS 41)-----	4		
Farm Surveying (AE 131)-----	2		
Farm Machinery (AE 221)-----		2	
Farm Power (AE 227)-----			2
Practical Plant Pathology (BSc 71)-----		4	
Vegetable Crop Production (TC 224, 226)-----	4		4
Harvesting and Marketing Vegetables (TC 225)-----		4	
Chemistry (PSc 41)-----			3
Electives -----	3	4	
	16 $\frac{1}{2}$	17 $\frac{1}{2}$	15 $\frac{1}{2}$
Junior Year			
American History (Hist 41)-----	2		
Farm Management (Ec 73)-----			3
Fertilizers and Fertilizer Practices (SS 72)-----		4	
Crop Pest Diseases (CP 321)-----	4		
Irrigated Pastures (CP 333)-----			4
Crop Farm Operation (CP 337)-----		3	
Electives -----	10	10	10
	16	17	17

VOCATIONAL CURRICULUM IN CROPS PRODUCTION

The first two years of the technical curriculum comprise the two-year vocational curriculum in Crop Production.

DESCRIPTION OF COURSES IN CROPS PRODUCTION

CP 131 Cereal Crops

(4)

Three one-hour lectures, one three-hour laboratory, fall quarter, freshman year. A course in the production and management of cereal grains and cereal grain hays produced in California. Topics stressed will cover soil management, seed bed preparation, irrigation and fertilization practices, rotations, selective weed control, harvesting, production costs, disease and pest control.

CP 132 Field Crops

(4)

Three one-hour lectures and one three-hour laboratory, winter quarter, freshman year. A study of row-planted field crops in California. Cotton, flax, field beans, sugar beets, and miscellaneous fiber and oil crops. Areas of production, management practices, varieties, fertilization, irrigation, cultivation, harvesting, disease and insect control are considered.

CP 133 Weeds and Weed (Poisonous plants) Control**(4)**

Three one-hour lectures and one three-hour laboratory, spring quarter, freshman year. A course in the study of weeds imposing a problem in the production of crops. Weed and weed-seed recognition; dissemination, conditions under which most harm is done, cultural control practices, herbicides both general and selective. Laws regarding weeds and weed seeds will also be considered.

CP 321 Crop Pest Control**(4)**

Three one-hour lectures and one three-hour laboratory, fall quarter, junior year. Methods of recognizing and combating insect pests, plant diseases, and rodents attacking commercial vegetable and field crops. Sprays, dusts, fumigation and poisoning as well as cultural and sanitation practices of control will be studied.

Prerequisites: BSc 122 or BSc15, BSc 126 or BSc 17, and BSc 223 or BSc 71

CP 333 Irrigated Pastures**(4)**

Three one-hour lectures and one three-hour laboratory, spring quarter, junior year. A forage crops course with emphasis on culture, management, fertilization, composition and costs of irrigated pastures. The seeds and plants composing irrigated pastures are studied with reference to identification, adaptation, growing season and utilization.

CP 337 Crop Farm Operation**(3)**

Two one-hour lectures and one three-hour laboratory, winter quarter, junior year. Advanced study in the operation of commercial vegetable and field crop acreages including additional practice and skills in land preparation, cultivation, planting, fertilization, and pest control, stressing familiarity with more specialized farm equipment.

Prerequisites: CP 131 or 132 and TC 224 or 226

TC 224 Vegetable Crop Production (Winter season)**(4)**

Three one-hour lectures and one three-hour laboratory; fall quarter; sophomore year. Study of major vegetable crops grown in commercial producing areas of California. Leading vegetable crops grown in the cooler seasons and areas will be stressed. All production practices will be covered.

TC 225 Harvesting and Marketing Vegetable Crops**(4)**

Three one-hour lectures and one three-hour laboratory; winter quarter; sophomore year. Study of harvesting methods, packaging and marketing of vegetable crop products. Market standards and grades are considered from a producer's viewpoint. Field trips to local packing sheds and markets as well as laboratory exercises will be conducted to familiarize students with different phases of harvesting and marketing.

TC 226 Vegetable Crop Production (Warm season)**(4)**

Three one-hour lectures and one three-hour laboratory; spring quarter; sophomore year. A study of production methods of spring planted vegetable crops which are frost tender. Sweet corn, tomatoes, beans, and other vegetable crops will be studied. Production and management practices will be stressed.

CP 461, 462 Undergraduate Thesis**(2) (2)**

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis, selection of the problem, collection of data, organization of material and preparation of the manuscript.

CP 463 Undergraduate Seminar**(2)**

Two one-hour meetings, spring quarter, senior year. New methods and developments, practices and procedures in the field.

ORNAMENTAL HORTICULTURE DEPARTMENT

OLIVER A. BATCHELLER

JAMES M. GRIFFIN

*HOWARD O. BOLTZ

Ornamental Horticulture is taught on the campuses at both the Voorhis Unit and at San Luis Obispo. Students desiring the degree may complete the first three years of their program at either San Dimas or San Luis Obispo. The last year may be completed, however, only at San Luis Obispo. Subtropical horticulture is stressed at the Voorhis Unit.

The function of this department is to train men for positions in the nursery business and the allied fields of the cut flower industry, park and estate maintenance, gardening and landscape work.

Students enrolled in this department are encouraged to take advantage of the college facilities in developing ornamental projects of their own. These activities are encouraged to broaden student experience and to facilitate a self-owned project.

Facilities

The facilities on the Voorhis campus consist of a lath house, two glass houses, propagation frames, a subtropical canyon, a two-acre nursery, and one and one-half acres of cut flowers. Extensive landscaped portions of the campus include, in addition to the buildings, seven acres of lawn and three miles of roadway. The general arrangement of the buildings and grounds offer opportunities for actual landscape and maintenance work on small residences, public buildings, and parks. Estates, parks, golf courses, nurseries, and flower plantings in the vicinity serve as a natural laboratory for field experience and practice.

Degree Curriculum

The degree curriculum in ornamental horticulture is a four-year program, the completion of which allows the graduate the Bachelor of Science degree in agriculture with a major in ornamental horticulture. This program has been designed especially to train individuals in the operation and management of commercial nurseries, glass houses, and plant propagation industries. The cut flower division and subtropical plant growing are especially emphasized at the Voorhis Unit.

Technical Curriculum

The three-year technical curriculum may be completed at the Voorhis Unit. This program has been developed especially to serve men wishing to prepare themselves for the technical positions in the ornamental horticulture field. The technical curriculum contains a maximum amount of training and experience in the ornamental horticulture major in a three-year period.

Vocational Curriculum

The two-year vocational curriculum can be completed at the Voorhis Unit. This curriculum has been developed to give a maximum amount of work in ornamental horticulture in a two-year period. The vocational curriculum is identical to the first two years of the technical curriculum.

Placement

Degree graduates are prepared for managerial and operational positions in general nursery work, specialized growing, landscape design and construction, estate management and for civil service positions with park and highway departments. Technical and vocational graduates are qualified for technical positions in the above fields and for maintenance work in commercial horticulture.

* On military leave.

DEGREE CURRICULUM IN ORNAMENTAL HORTICULTURE, VOORHIS UNIT

Freshman Year			
	F	W	S
English Composition (Eng 104, 105, 106) -----	3	3	3
Mathematics (Math 102, 103) -----		2	3
Agricultural Mechanics (AE 121, 122, 123) -----	2	2	2
Physical Education (PE 141, 142, 143) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107) -----	2		
Botany (BSc 121, 122) -----	4	4	
Entomology (BSc 126) -----			4
Basic Horticulture (OH 131) -----	4		
Subtropical Plant Materials (OH 132) -----		4	
General Nursery Operation (OH 133) -----			4
Electives -----		2	
	15 $\frac{1}{2}$	17 $\frac{1}{2}$	16 $\frac{1}{2}$
Sophomore Year			
Principles of Economics (Ec 201, 202) -----	3	3	
Farm Tractors (AE 241) -----			2
Soils (SS 221) -----		4	
Farm Surveying (AE 131, 132) -----		2	2
Public Speaking (Eng 201) -----			2
General Plant Pathology (BSc 223) -----	4		
Physical Education (PE 241, 242, 243) -----	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Broad Leaf Trees (OH 231) -----	4		
Specialized Propagation Practices (OH 232) -----		4	
Principles of Landscape Design (OH 224) -----	3		
Landscape Design of Small Homes (OH 225) -----		3	
Planting Design (OH 226) -----			3
Electives -----	3		7
	17 $\frac{1}{2}$	16 $\frac{1}{2}$	16 $\frac{1}{2}$
Junior Year			
Accounting (Ec 301, 302) -----	3	3	
¹ Farm Management (Ec 303) -----			3
General Inorganic Chemistry (PSc 324, 325) -----	4	4	
Organic Chemistry (PSc 326) -----			4
² Diseases and Pests of Ornamental Plants (OH 327) -----			3
Fertilizers and Fertilizer Practices (SS 322) -----			4
Genetics (BSc 303) -----	3		
³ Electives -----	7	9	3
	17	16	17
Senior Year (San Luis Obispo)			
¹ Principles of Marketing (Ec 401) -----	3		
¹ Cooperative Marketing (Ec 402) -----		3	
Agricultural Prices (Ec 403) -----			3
Agricultural Biochemistry (PSc 328) -----		4	
Family Psychology (Psy 403) -----			3
⁴ State and Local Government (Pol Sci 401) -----			3
Undergraduate Thesis (OH 461, 462) -----	2	2	
Undergraduate Seminar (OH 463) -----			2
American Government (Pol Sc 301) -----	3		
Survey of United States History (Hist 304) -----			3
Electives -----	8	8	3
	16	17	17

¹ Three units of Agricultural Economics to be selected from the courses listed.² Course meets Plant Pathology requirements.³ Twelve units of electives must be chosen with the approval of the adviser.⁴ Background of Modern Affairs (Hist 305) may be substituted.

TECHNICAL CURRICULUM IN ORNAMENTAL HORTICULTURE

Freshman Year	F	W	S
Technical English (Eng 11, 12, 13)	3	3	3
Agricultural Mathematics (Math 15)		3	
Physical Education (PE 141, 142, 143)	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Health and Hygiene (PE 107)			2
Insect Biology (BSc 17)			3
Plant Biology (BSc 14, 15)	3	3	
Agricultural Mechanics (AE 121, 122, 123)	2	2	2
Basic Horticulture (OH 131)	4		
Subtropical Plant Material (OH 132)		4	
General Nursery Operations (OH 133)			4
Electives	3	2	3
	<u>15½</u>	<u>17½</u>	<u>17½</u>
Sophomore Year			
Economic Problems (Ec 41)	3		
Farm Bookkeeping (Ec 42, 43)		3	3
American Government (Pol Sc 42)			3
Physical Education (PE 241, 242, 243)	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Farm Tractors (AE 241)			2
Soils (SS 41)	4		
Farm Surveying (AE 131)		2	
Broad Leaf Trees (OH 231)	4		
Specialized Propagation Practice (OH 232)		4	
Principles of Landscape Design (OH 224)	3		
Planting Design (OH 226)			3
Chemistry (PSc 41)			3
Practical Plant Pathology (BSc 71)		4	
Electives	2	2	2
	<u>16½</u>	<u>15½</u>	<u>16½</u>
Junior Year			
Farm Management (Ec 73)			3
Fertilizers and Fertilizer Practices (SS 72)		4	
Diseases and Pests of Ornamental Plants (OH 327)			3
American History (Hist 41)	2		
Landscape Design of Small Homes (OH 225)		3	
* Electives	15	10	10
	<u>17</u>	<u>17</u>	<u>16</u>

VOCATIONAL CURRICULUM IN ORNAMENTAL HORTICULTURE

The first two years of the Technical Curriculum comprise the two-year vocational curriculum of Ornamental Horticulture.

DESCRIPTIONS OF COURSES IN ORNAMENTAL HORTICULTURE

OH 129 Landscape Drafting (2)

One one-hour lecture, one three-hour laboratory, spring quarter. A basic course in the mechanics of drawing, with an emphasis on perspectives, elevations and construction drawings.

OH 131 Basic Horticulture (4)

Three one-hour lectures, one three-hour laboratory, fall quarter, freshman year. A basic course in horticulture with emphasis on maintenance and general gardening following plans and work outlines.

* Twelve units of electives must be chosen with the approval of the adviser.

OH 132 Subtropical Plant Material**(4)**

Three one-hour lectures, one three-hour laboratory, winter quarter, freshman year. A basic course in plant material covering 200 shrubs and vines grown and used in the subtropical area of Southern California. Special consideration is given to the identification, habits of growth, cultural requirements, and landscape use of the material.

OH 133 Principles and Practices of Nursery Operation**(4)**

Three one-hour lectures, one three-hour laboratory, spring quarter, freshman year. A practical course in the principles and practices of nursery management, selling, buying, handling stock, the use of the school's nursery growing ground for the practical work, with additional study of the large and varied nursery field found in Southern California. Field trips will be taken to the outstanding nurseries of the area.

OH 224 Principles of Landscape Design**(3)**

Two one-hour lectures, one three-hour laboratory, fall quarter, sophomore year. A basic course in the principles of Landscape Design with a practical application in the laboratory through the solving of actual design problems.

OH 225 Landscape Design of Small Homes**(3)**

One one-hour lecture, two three-hour laboratories, winter quarter, sophomore year. A continuation of OH 224 with special emphasis on the design of small city lots. Each student designs and renders in color a minimum of four small home properties. Prerequisite: OH 224

OH 226 Planting Design**(3)**

Two one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. A practical course covering the proper association of plant materials according to texture, color, and moss; the techniques involved in their grouping, arranging and planting about buildings. In the laboratory, an emphasis is put on the developing of planting plants.

Prerequisites: OH 132, OH 231

OH 231 Broad Leaf Trees**(4)**

Three one-hour lectures, one three-hour laboratory, fall quarter, sophomore year. A continuation of the study of the plant materials grown and used in this subtropical area, with special emphasis on the presentation of 150 trees, their identification, culture care, and landscape use.

Prerequisite: OH 132

OH 232 Specialized Propagation Practices**(4)**

Three one-hour lectures, one three-hour laboratory, winter quarter, sophomore year. This course covers the very specialized practice of seedage, graftage, inarching and bench grafting, which are performed in the preparation of special material.

Prerequisites: OH 131, OH 132 and BSc 122 or BSc 15

OH 236 Native Plant Materials**(3)**

Two one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. A presentation of 130 plants, native to California, their identification, culture, care, and landscape use. In addition, 20 ferns are covered in like manner.

OH 321 Herbaceous Plants**(4)**

Three one-hour lectures, one three-hour laboratory, spring quarter, junior year. A study of both the ornamental annual and herbaceous perennials grown in the subtropical areas of California. Special consideration is given to the identification, habits of growth, culture requirements, and landscape uses of the materials.

Prerequisites: OH 132, OH 231

OH 322 Greenhouse Design and Management**(4)**

Three one-hour lectures, one three-hour laboratory, winter quarter, junior year. This course includes the study of construction, management, and maintenance of the school's greenhouses.

Prerequisites: OH 131, OH 133, OH 232

OH 324 Park Design and Management (4)

Two one-hour lectures, two three-hour laboratories, fall quarter, junior year. Advanced work in landscape design, including design problems of parks, schools and public institutions.

Prerequisites: OH 224, OH 225

OH 326 Estate Design (3)

One one-hour lecture, two three-hour laboratories; spring quarter; junior year. Advanced work in landscape design dealing primarily with problems of larger home grounds or estates.

Prerequisites: OH 224, OH 225.

OH 327 Diseases and Pests of Ornamental Plants (3)

Two one-hour lectures, one three-hour laboratory; spring quarter; junior year. This is a detailed study of the diseases and pests of ornamental plants, their effect on plants and their prevention and control.

Prerequisites: OH 132, OH 231 and BSc 223 or BSc 71.

OH 334 Commercial Flower Growing (4)

Three one-hour lectures, one three-hour laboratory, fall quarter, junior year. This subject treats of the growing practices and marketing procedures of the commercial cut flower crops of Southern California. It includes work on the college flower growing grounds, and numerous visits to the many growing grounds in the nearby area.

Prerequisites: OH 132, OH 232

OH 337 Landscape Contracting (2)

One one-hour lecture, one three-hour laboratory; fall quarter; junior year. A course designed to train students in the handling of men and job organization, as well as the making of construction drawings and job estimates.

Prerequisites: AgE 121A, AgE 122A.

OH 338 Landscape Contracting (2)

One one-hour lecture, one three-hour laboratory; winter quarter; junior year. A continuation of OH 337 with more emphasis on job organization.

Prerequisite: OH 337.

OH 421 Estate Maintenance and Management (3)

Two one-hour lectures, one three-hour laboratory; fall quarter; senior year. The college's 12-acre campus is used as a laboratory in the planning and maintenance of grounds and estates. The students do the planning of the work of the grounds, and supervise the students in Basic Horticulture class.

Prerequisites: OH 131, OH 132, OH 133, OH 224, OH 225, OH 231, and OH 232.

OH 422 Tree Surgery (3)

Two one-hour lectures, one three-hour laboratory; spring quarter; senior year. This course deals with the work of bracing, wiring, topping, heavy pruning, using of ropes, and cavity treatment and care of trees.

Prerequisites: OH 131, OH 231, OH 232.

OH 461, 462 Undergraduate Thesis (2) (2)

Two one-hour meetings, fall and winter quarters, senior year. Development and writing of the thesis, selection of the problem, collection of data, organization of material and preparation of the manuscript.

OH 463 Undergraduate Seminar (2)

Two one-hour meetings, spring quarter, senior year. New methods and developments, practices and procedures in the field.

RELATED COURSES AT THE VOORHIS UNIT, SAN DIMAS, CALIFORNIA

DESCRIPTIONS OF COURSES IN AGRICULTURAL ENGINEERING AND MECHANICS

HAVEN Q. CONARD

ALBERT E. KATTENHORN

AE 121 Carpentry and Concrete

(2)

One one-hour lecture, one three-hour laboratory; fall or spring quarter; freshman year. This course deals with the elements of carpentry and concrete work as they are applied to farm buildings and structures, concrete walks, floors, and foundations. Practice in the use of both hand and power equipment used in these operations will be included in the laboratory work.

AE 122 Electricity and Plumbing

(2)

One one-hour lecture, one three-hour laboratory; fall or winter quarter; freshman year. This course deals with the elements of farm structures wiring, materials used in electrical wiring; insulation and servicing of electric motors; soldering as applied to electrical and sheet metal work; cutting, threading and fitting of iron pipe and determining the sizes of pipe to use for small sprinkler systems.

AE 123 Welding

(2)

One one-hour lecture, one three-hour laboratory; winter or spring quarter; freshman year. This is a beginning course including flat, horizontal, and vertical arc welding of mild steel; flat, horizontal, vertical and overhead acetylene welding of mild steel and acetylene brazing of mild steel and cast iron.

AE 131 Farm Surveying

(2)

One one-hour lecture, one three-hour laboratory; fall or winter quarter; sophomore year. This course deals with the fundamentals of surveying as related to irrigation, drainage, and soil conservation.

Prerequisite: Math 102 or Math 15.

AE 132 Farm Surveying

(2)

One one-hour lecture, one three-hour laboratory; spring quarter; sophomore year. A continuation of AE 131, with additional emphasis placed on practical field surveying practices and location survey methods.

Prerequisite: AE 131.

AE 221 Farm Machinery

(2)

One one-hour lecture, one three-hour laboratory; spring quarter; sophomore year. A study of the elements of farm machinery; haying equipment, comprising mowing machines, rakes, balers, etc.; spraying and dusting machines; grain drills and broadcast seeders. Emphasis is placed on care, repair, adjustments, and field operation of the machines studied.

Prerequisites: AE 123 and AE 121 or AE 122.

AE 222 Farm Machinery

(2)

One one-hour lecture, one three-hour laboratory; sophomore year. A study of soil preparation machinery, tillage and cultivation implements, truck and row crop planters, and fertilizing machines. Care, repair, adjustment and field operation of these machines is emphasized.

(May be offered if demand justifies.)

Prerequisites: AE 123 and AE 121 or AE 122.

AE 227 Farm Power

(2)

One one-hour lecture, one three-hour laboratory; winter quarter; sophomore year. The fundamental principles of the internal combustion engine with emphasis on both gasoline and Diesel tractors. Laboratory practice consists of trouble shooting, overhauling, and making major adjustments of various types of gasoline and Diesel engines.

Prerequisite: AE 122.

AE 233 Pest Control Equipment

(2)

One one-hour lecture, one three-hour laboratory; spring quarter; sophomore year. This course is designed to familiarize agricultural inspection majors with spraying, dusting, and fumigating equipment in common commercial use. Also includes an introduction to basic fundamentals of gasoline engines and trouble shooting methods of power units on the above mentioned machines.

Prerequisite: AE 121, 122 or 123.

AE 241 Farm Tractors

(2)

One one-hour lecture, one three-hour laboratory; fall quarter; freshman year. This course deals with the operation, servicing and minor adjustments of farm tractors.

AE 244 Farm Equipment Projects

(1)

One three-hour laboratory; any quarter; sophomore year. This is a course designed for those students who wish to take advantage of the facilities of the school shops to build farm equipment for their own use.

Prerequisites: AE 121 or AE 123 (depending on type of project).

DESCRIPTIONS OF COURSES IN ANIMAL HUSBANDRY

AH 101 Feeds and Feeding

(2)

Two one-hour lectures; fall quarter; freshman year. A study of the constituents of feeds, carbohydrates, proteins, fats, minerals, vitamins and water; their utilization by the animal body. The digestive system, the processes of digestion and assimilation of various feed constituents. Computations of standard ration for livestock.

AH 120 Introduction to Animal Husbandry

(3)

Two one-hour lectures and one three-hour laboratory, fall quarter, freshman year. A study of the breeds and market classes of livestock. Consideration will be given to production factors, breeding, selection and feeding. A study of health, hygiene, and general management.

DH 121 Elements of Dairying

(4)

Three one-hour lectures, one three-hour laboratory; spring quarter; freshman year. A general and elementary course in dairying. The importance of the industry from all standpoints, the composition of all the common dairy products, and the common tests that are in use; a study of the more commonly used dairy machinery and equipment, and a study of general practices in feeding and management of a dairy herd.

DESCRIPTION OF COURSES IN ENGLISH, JOURNALISM AND PUBLIC SPEAKING

ALBERT J. ASCHENBRENNER

RAY CANTON

LOWELL K. WEEKS

Eng 4 Preparatory English

(3)

Three one-hour lectures, any quarter, freshman year. A course which gives no credit for the degree. For degree students whose weakness in English usage indicates need for training in grammar, punctuation, sentence structure, and paragraph development.

Eng 11 Technical English

(3)

Three one-hour lectures, fall quarter, freshman year. The course includes grammar study and drill, correct usage, sentence structure, punctuation, and the writing of paragraphs related to the students' future vocational field.

Eng 12 Technical English

(3)

Three one-hour lectures, winter quarter, freshman year. The course includes drill in mechanics, primarily punctuation; business letter forms, practice in writing business letters, critical reading.

Eng 13 Technical English

(3)

Three one-hour lectures, spring quarter, freshman year. The course includes practice in writing explanations of processes, analyses of job problems, etc.; study of special types of business letters, such as sales and application; practice in making out such forms as job applications, civil service blanks, and tax statements; critical reading.

Eng 104 English Composition**(3)**

Three one-hour lectures, fall quarter, freshman year. This course includes the planning of expository writing, limiting the subject and outlining; paragraph development; eliminating errors in the sentence structure; review of punctuation; and reading for comprehension.

Eng 105 English Composition**(3)**

Three one-hour lectures, winter quarter, freshman year. The course includes vocabulary building, dictionary study, developing sentence style, précis writing, the composition as a whole, the business letter, and reading for comprehension.

Eng 106 English Composition**(3)**

Three one-hour lectures, spring quarter, freshman year. The course continues vocabulary building and includes the use of the library, the use of standard reference books, research writing, reading for opinion, and persuasive writing.

Eng 201 Public Speaking**(2)**

Two one-hour lectures, any quarter, sophomore year. The course offers training in selecting a subject, gathering material, organizing the speech, and experience in making speeches.

Prerequisite: Eng 11 or 104

Eng 203 Public Speaking**(3)**

Two one-hour lectures, spring quarter, sophomore year. The course follows English 201 and includes oral reading, forum discussion, debate, speeches for special occasions, and radio speaking.

Jour 101 Introductory Journalism**(3)**

Three one-hour lectures, fall quarter, freshman year. An introduction to journalism and to the technique of writing the news story.

Jour 102 Reporting**(3)**

Three one-hour lectures, winter quarter, freshman year. Application of news writing principles to the reporting of news events.

Prerequisite: Jour 101

Jour 123 Editing and Editorial Writing**(2)**

One-hour lecture, one three-hour laboratory, spring quarter, freshman year. Copy desk work, head writing, page make-up, and the technique of editorial writing.

Prerequisite: Jour 102

Jour 251, 252, 253 Journalism Practice**(1-3)**

From three to nine hours laboratory, any quarter, any year. Credit arranged for students holding editorial positions on college publications or student news bureau.

Prerequisite: One year of journalism or the instructor's permission.

DESCRIPTION OF COURSES IN DECIDUOUS FRUIT PRODUCTION**FP 134 Pomology****(4)**

Three one-hour lectures, one three-hour laboratory, fall quarter, freshman year. Commercial deciduous fruits and nuts, varieties, production areas, seasonal cultural practices and problems.

FP 135 Pomology**(4)**

Three one-hour lectures, one three-hour laboratory, winter quarter, freshman year. Continuation of FP 134. Establishing an orchard, pruning, pest control, rootstocks, propagation, seasonal cultural practices.

Prerequisite: FP 134

FP 136 Small Fruit Production**(4)**

Three one-hour lectures, one three-hour laboratory, spring quarter, freshman year. A specialized course in small fruit production, primarily berries. Varieties, production areas, pruning, pest control, seasonal cultural practices.

FP 234 Deciduous Pest Control

(4)

Three one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. Advanced studies of deciduous pests and diseases, including field identification and application of control materials.

Prerequisites: FP 135, BSc 126 or BSc 17 and BSc 223 or BSc 71

FP 236 Orchard Management

(4)

Three one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. Problems of fertilization, irrigation, cost of production, pruning, cover crops, labor management, harvesting, and marketing. Evaluating orchards and extended tours made into the field. Problems in the operation of the packing house, dry yard, and dehydration will be studied.

Prerequisites: FP 134, 135

FP 239 Fruit and Crop Plant Propagation

(4)

Three one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. Propagation by seed, cuttings, layering, grafting, and budding. Special emphasis upon commercial practices.

Prerequisite: BSc 122

FP 331 Viticulture

(4)

Three one-hour lectures, one three-hour laboratory, fall quarter, junior year. Problems dealing with the production and marketing of grapes.

DESCRIPTION OF COURSES IN BIOLOGICAL SCIENCE

HOWARD S. BROWN

JEROME E. DIMITMAN

JOHN F. LAMIMAN

HAROLD L. LENT

BSc 14 Plant Biology

(3)

Two one-hour lectures, one three-hour laboratory, fall and winter quarters, freshman year. Elementary principles of plant structure and function.

BSc 15 Plant Biology

(3)

Two one-hour lectures, one three-hour laboratory, winter and spring quarters, freshman year. General survey of the plant kingdom with emphasis on environmental relationships and basic plant classifications.

Prerequisites: BSc 14, or BSc 121

BSc 17 Insect Biology

(3)

Two one-hour lectures, one three-hour laboratory, fall quarter (agricultural inspection majors) and spring quarter (production majors), freshman year. A study of the identification, structure, life history and behavior of the insects that are of agricultural importance. Students will be required to make a collection.

BSc 71 Practical Plant Pathology

(4)

Three one-hour lectures, one three-hour laboratory, winter quarter, junior year. Principal diseases of plants, symptoms, control methods, and identification.

Prerequisites: BSc 122 or BSc 15.

BSc 121 General Botany

(4)

Three one-hour lectures, one three-hour laboratory; fall and winter quarters; freshman year. Basic botany; principles of plant structure and functions.

BSc 122 General Botany

(4)

Three one-hour lectures, one three-hour laboratory, winter and spring quarters, freshman year. General survey of the plant kingdom. Basic principles of plant reproduction, classification and environmental relations.

Prerequisite: BSc 121

BSc 126 General Entomology

(4)

Three one-hour lectures, one three-hour laboratory, fall quarter (agricultural inspection majors), spring quarter (production majors), freshman year. A study of the classification, structures, life histories and behavior of insects. Students will be required to make a collection.

BSc 131, 132 General Zoology

(4) (4)

Two one-hour lectures, two three-hour laboratories, fall and winter quarters, freshman year. Basic zoology, principles of animal structure and functions.

BSc 223 General Plant Pathology

(4)

Three one-hour lectures, one three-hour laboratory, fall and spring quarters, sophomore year. General principles, symptoms, and control methods of diseases of plants. Study of plant diseases caused by bacteria, fungi, viruses, and environment. Classification of fungi sufficient for identification of disease organisms.

Prerequisite: BSc 122

BSc 236 Plant Classification

(3)

Two one-hour lectures, one three-hour laboratory, spring quarter, sophomore year. Recognition of the major orders and families of flowering plants encountered in the study of ornamental horticulture and cultivated crops.

Prerequisite: BSc 122 or BS 15

BSc 303 Genetics

(3)

Three one-hour lectures, fall quarter, junior year. Introduction to the principles of heredity and variation as applied to plant and animal breedings.

Prerequisite: BSc 122 or equivalent

DESCRIPTION OF COURSES IN HEALTH AND PHYSICAL EDUCATION

ROBERT B. STULL

DUANE S. WHITEHEAD *

PE 101 Safety and First Aid

(2)

Freshman year, fall quarter. A standard American Red Cross First Aid Course which gives instruction and practice in the immediate and temporary care of injuries and sudden illness.

PE 103 Swimming and Water Sports Theory and Practice

(2)

Freshman year, spring quarter. A course in the supervision of pool activities. Swimming instruction and safety are stressed.

PE 106 Community Recreation

(3)

Winter quarter, freshman year. The supervision and administration of community recreation are considered. Games and activities suitable for a community recreation program are studied.

PE 107 Health and Hygiene

(2)

Two one-hour lectures, any quarter, freshman year. A course covering personal hygiene and health education and the relation of exercise, nutrition, and application of the rules of hygiene in maintaining physical and mental health. Included in this course are units in fire prevention, public safety, and alcohol and other drugs. Required for freshmen and sophomores.

PE 141 Physical Education

(½)

Three one-hour laboratory periods, fall quarter, freshman year. Fundamentals of sports and games.

PE 142 Physical Education

(½)

Three one-hour laboratory periods, winter quarter, freshman year. Tumbling and apparatus work; defense activities (boxing and wrestling); gymnastics and calisthenics.

PE 143 Physical Education

(½)

Three one-hour laboratory periods, spring quarter, freshman year. Continuation of PE 141, 142. Sports activities; physical tests; progressive activities.

PE 144, 145 Physical Education

(½) (½)

Three one-hour laboratory periods, fall and spring quarters, freshman year. Beginning swimming for all who do not pass college swimming test.

* On military leave.

PE 151 Competitive Athletics (½)

Fall quarter, freshman year. May be substituted for required physical training during fall quarter by those qualified to compete in intercollegiate sports program.

PE 152 Competitive Athletics (½)

Winter quarter, freshman year. Continuation of PE 151.

PE 153 Competitive Athletics (½)

Spring quarter, freshman year. Continuation of PE 152.

PE 201 Principles of Physical Education (3)

Three one-hour lectures, sophomore year, fall quarter. A study of the history of physical education and the concept of physical education as a profession. The important correlation between principles and methods is emphasized.

PE 202 Intramural Sports (3)

Sophomore year, winter quarter. A study of sports adapted to intramural use. Organization of intramural programs is stressed.

PE 203 Health Education (2)

Fall quarter, sophomore year. The purpose of this course is to acquaint students of physical education, teachers in service, and others with the broad general nature of health problems in schools.

PE 241 Sports Education (½)

Three one-hour laboratory periods, fall quarter, sophomore year. Devoted to the training in and competition of seasonal sports such as: speed ball, touch football, and tennis.

PE 242 Sports Education (½)

Three one-hour laboratory periods, winter quarter, sophomore year. Devoted to training in and competition of seasonal sports such as: basketball, badminton, volleyball, boxing, and wrestling.

PE 243 Sports Education (½)

Three one-hour laboratory periods, spring quarter, sophomore year. Devoted to training in and competition of seasonal sports such as: tennis, track and cross country running, softball, and soccer.

PE 251 Competitive Athletics (½)

Fall quarter, sophomore year. May be substituted for required physical training during fall quarter by those qualified to compete in intercollegiate sports program.

PE 252 Competitive Athletics (½)

Winter quarter, sophomore year. Continuation of PE 251.

PE 253 Competitive Athletics (½)

Spring quarter, sophomore year. Continuation of PE 252.

DESCRIPTION OF COURSES IN MATHEMATICS

DONALD E. REES

Math 1 Practical Mathematics (2)

Two one-hour lectures, fall quarter, freshman year. Minimum essentials of mathematics for practical purposes. Deals with fractions, decimals, solution of equations, farm measurements, and a review of fundamental operations. Required of all students in agriculture except those who satisfactorily pass a placement examination.

Math 15 Agricultural Mathematics (3)

Three one-hour lectures, winter quarter, freshman year. Consists of a study of the mathematical problems which are most commonly found in practical agriculture. Topics covered consist of such things as areas, volumes, capacities, mathematics of construction, levers, pulleys, work and power, and pressure.

Math 102 Agricultural Mathematics**(2)**

Two one-hour lectures, winter quarter, freshman year. Consists of graphical methods, percentage, equations, lengths, areas and volumes, ratio and proportion. Applications are made to agricultural problems.

Math 103 Agricultural Mathematics**(3)**

Three one-hour lectures, spring quarter, freshman year. Consists of the right triangle, averages, graphs, exponents, and logarithms. Applications are made to agriculture.

Prerequisite: Math 102

Math 107 Intermediate Algebra**(3)**

Three one-hour lectures, fall quarter, freshman year. Selected topics from algebra and advanced work in trigonometry.

DESCRIPTION OF COURSES IN MUSIC

LOWELL K. WEEKS

Mu 141, 142, 143 Orchestra**(2) (2) (2)**

Two one and one-half hour periods, one three-hour period; fall, winter and spring quarters; freshman year. Limited to those who have had considerable experience. Students have an opportunity to play for various college entertainments.

Mu 151, 152, 153 Band**(1) (1) (1)**

Two one and one-half hour periods; fall, winter and spring quarters; freshman year. Limited to those students who have had experience with band instruments. Students have opportunities to play for football games, assemblies, rallies and other programs.

Mu 154, 155, 156 Glee Club**(1) (1) (1)**

Two one and one-half hour periods; fall, winter and spring quarters; freshman year. Members of the Glee Club participate in various college entertainments and in programs presented at other schools and outside organizations.

Mu 241, 242, 243 Orchestra**(2) (2) (2)**

Two one and one-half hour periods, one three-hour period; fall, winter and spring quarters, sophomore year. A continuation of Mu 141, 142, 143.

Mu 251, 252, 253 Band**(1) (1) (1)**

Two one and one-half hour periods; fall, winter and spring quarters; sophomore year. A continuation of Mu 151, 152, 153.

Mu 254, 255, 256 Glee Club**(1) (1) (1)**

Two one and one-half hour periods; fall, winter and spring quarters; sophomore year. A continuation of Mu 154, 155, 156.

Mu 341, 342, 343 Orchestra**(2) (2) (2)**

Two one and one-half hour periods, one three-hour period; fall, winter and spring quarters; junior year. A continuation of Mu 241, 242, 243.

Mu 351, 352, 353 Band**(1) (1) (1)**

Two one and one-half hour periods; fall, winter and spring quarters; junior year. A continuation of Mu 251, 252, 253.

Mu 354, 355, 356 Glee Club**(1) (1) (1)**

Two one and one-half hour periods; fall, winter and spring quarters; junior year. A continuation of Mu 254, 255, 256.

DESCRIPTION OF COURSES IN POULTRY HUSBANDRY

Poul 131 Introduction to Poultry Production (4)

Three one-hour lectures, one three-hour laboratory, fall quarter, freshman year. A study of the importance and place of the poultry industry as related to California conditions. The importance of the industry from all standpoints, its organization and a study of the more commonly used practices. A study of poultry breeds and their commercial uses. Judging for utility and exhibition type.

Poul 122 Poultry Brooding (4)

Three one-hour lectures, one three-hour laboratory, winter quarter, freshman year. A study of and planning for the replacement program on the California poultry ranch. A study of brooding equipment, brooding principles and practices, growth and development of the chick, care and feeding of growing stock. Diagnosis, prevention, and control of chick diseases and vices.

Poul 133 Principles of Feeding Chickens, Turkeys and Rabbits (4)

Three one-hour lectures, one three-hour laboratory, spring quarter, freshman year. A study of poultry and rabbit feeds and feeding principles; technique of feeding birds economically for egg production, growth and fattening. Also feeding of rabbits economically for production, growth, and fattening. Nutritional diseases and deficiencies are discussed. The manufacturing of feeds and constructing of formulae for specific purposes. The fundamentals of metabolism and digestion of the fowl and rabbit.

Prerequisite: AH 101

DESCRIPTION OF COURSES IN SOCIAL SCIENCE

GEORGE CARLBERG

ALBERT ASCHENBRENNER

Ec 41 Economic Problems (3)

Three one-hour lectures, fall quarter, sophomore year. A study of the practical business problems of the farmer. Included in this course are problems involving property ownership such as deeds, escrow procedures, and title insurance; compensation, fire, property, damage, and public liability insurance; negotiable instruments; employer-employee relationship, involving housing, boarding and recreation for hired help; safety and accident prevention; contracts and leases and banking procedures.

Ec 42 Farm Bookkeeping (3)

Three one-hour lectures, winter quarter, sophomore year. A study of the fundamental bookkeeping procedures as they relate to farm accounting. Such things as the classification of accounts, the dual nature of a business transaction, net worth and operating statements, inventories, depreciation and depreciation records, recording daily transactions, adjusting and closing accounts, and the preparation of reports are studied. Particular attention is paid to information needed for the income tax return.

Ec 43 Farm Bookkeeping (3)

Three one-hour lectures, spring quarter, sophomore year. A continuation of Economics 42. Instruction during this quarter is based on a series of farm accounting problems which involve principles of accounting and the accounting cycle.

Prerequisite: Ec 42

Ec 73 Farm Management (3)

Three one-hour lectures, spring quarter, junior year. A study of the principles involved in the combination of the factors of production. Prices and economic trends, budgets, labor and feed records, choice and combination of enterprises, enterprise analysis, and credit are typical of the subjects covered. A term paper on a management topic is required in the course.

Prerequisites: Ec 42, Ec 43

Ec 201, 202 Principles of Economics**(3) (3)**

Three one-hour lectures; fall, winter, and spring quarters; sophomore year. Introduction to economic theory. Consideration is given to organization for production, the factors of production, namely: land, labor, capital and management, and the problems of price determination under conditions of free competition. Illustrations are drawn from the field of agriculture.

Ec 301, 302 Accounting**(3) (3)**

Three one-hour lectures, winter and spring quarters, junior year. A study of the fundamentals of accounting with their particular application to the business of farming. Also deals with cost of production studies and their place in the accounting system.

Ec 303 Farm Management**(3)**

Three one-hour lectures, spring quarter, junior year. A course in management dealing with enterprise efficiency studies and cost accounting, placing particular emphasis on the problems of the farm manager.

Hist 41 American History**(2)**

Two one-hour lectures, fall quarter, junior year. A brief course in the history of the United States with particular emphasis on the American way of utilizing the resources of nature, people, and the cultural heritage. To give the student background for understanding and acting on today's problems.

Hist 304 Survey of United States History**(3)**

Three one-hour lectures, spring quarter, junior year. A survey of United States foreign policies, the development of the United States from an agricultural to an industrial nation, America's role of leadership in world affairs, the relationship between foreign problems and domestic affairs are the topics included in this course. Much current material is included.

Prerequisite: Pol Sc 301

Pol Sc 42 American Government**(3)**

Three one-hour lectures, spring quarter, sophomore year. A study of the functions of American government as it relates to the welfare of its citizens.

Pol Sc 301 American Government**(3)**

Three one-hour lectures, fall quarter, junior year. Principles and problems in relation to the development, organization, and functions of the American system of government. Degree students only.

Psy 101 Personal Development**(2)**

Two one-hour lectures, fall quarter, freshman year. This course takes up study techniques, vocational and educational planning, opportunities at California State Polytechnic College, and certain aspects of personal adjustment psychology.

Psy 202, 203 General Psychology**(3) (2)**

Three one-hour lectures, winter quarter; two one-hour lectures, spring quarter; sophomore year. A survey of the objectives, methods, and experimentally attested facts of the science are presented, stressing normal adult psychology and its application to the prediction and control of human behavior. Lectures, demonstrations, assigned readings, and discussions.

DESCRIPTION OF COURSES IN PHYSICAL SCIENCE

THOMAS MORAN

DONALD E. REES

PSc 4 Preparatory Chemistry**(3)**

Three one-hour lectures, fall quarter, freshman or sophomore year. The fundamental principles of chemistry. For those degree students whose background is deficient in chemistry and mathematics.

PSc 41 Chemistry in Agriculture

(3)

Three one-hour lectures, fall quarter, sophomore year. The fundamental principles of chemistry as taught through applications in agriculture. For all vocational and technical students in agriculture.

PSc 324, 325 General Inorganic Chemistry

(4) (4)

Three one-hour lectures, one three-hour laboratory; fall and winter quarters; sophomore or junior year. A study of the fundamental principles of chemistry and the common elements and their compounds with applications to agriculture. For agricultural students.

Prerequisites: Math 103 or equivalent; successful completion of a placement test, or PSc 4 or its equivalent.

PSc 326 Organic Chemistry

(4)

Three one-hour lectures and one three-hour laboratory, spring quarter, junior year. The fundamental concepts of organic chemistry with applications to agricultural and industrial processes.

Prerequisite: PSc 322 or 325.

PSc 337 Soil Analysis

(2)

One one-hour lecture, one three-hour laboratory; fall quarter; junior year. Chemical analysis as a means of diagnosing problems related to Western soils.

Prerequisites: PSc 324, PSc 325, SS 221, Math 102, Math 103.

PSc 338 Plant Tissue Analysis

(2)

One one-hour lecture, one three-hour laboratory; winter quarter; junior year. Chemical analysis of plant tissue as a guide to fertilization and crop production.

Prerequisites: PSc 324, PSc 325, SS 221, Math 102, Math 103.

PSc 339 Soil Physics

(2)

One one-hour lecture, one three-hour laboratory; spring quarter; junior year. The study of the fundamental aspects of soil physics and their practical application.

Prerequisites: PSc 324, PSc 325, SS 221, Math 102, Math 103.

DESCRIPTION OF COURSES IN SOILS

HARRY V. WELCH, JR.

SS 41 Soils

(4)

Three one-hour lectures, one three-hour laboratory; fall quarter; sophomore year. An introductory course dealing with the origin, formation, texture, structure, and the mechanical and chemical composition of soils. Moisture, organic matter and the effects of tillage, drainage, and irrigation of soils. Classification of soils and the use of soil maps in California agriculture. Use of fertilizers and soil amendments and their effect on crop production.

SS 72 Fertilizers and Fertilizer Practices

(4)

Three one-hour lectures, one three-hour laboratory; winter quarter; junior year. Designed for nondegree students who want information, techniques, and principles governing the use of fertilizers in California agriculture. The course will deal with the latest methods of determining fertilizer needs of different soil and crop conditions, criteria involved in the selection of fertilizer materials for specific crop production practices and the most effective methods of application.

Prerequisite: SS 41

SS 221 Soils

(4)

Three one-hour lectures, one three-hour laboratory; winter quarter; sophomore year. An introductory course dealing with the origin, formation, texture, structure, and the mechanical and chemical composition of soils. Moisture, heat, organic matter and the effects of tillage, drainage, and irrigation, and soil productivity. Classification of soils and the use of fertilizers and soil amendments to increase or maintain crop production.

SS 222 Soil Management**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; sophomore year. Occurrence, composition, productivity, plant nutrient availability, comparative values, and management of different soil types. Laboratory deals largely with the maintenance and improvement of soil fertility, effect of various crops and farming systems on fertility gains and losses of soils, effects of barnyard and green manuring practices on soil productivity, control of soil moisture and problems of alkali and dry land management.

Prerequisite: SS 221.

SS 322 Fertilizers and Fertilizer Practices**(4)**

Three one-hour lectures, one three-hour laboratory; spring quarter; junior year. Plant nutrient requirements of crops; effect of soil and climate conditions on the availability of plant nutrients in the soil; composition and value of fertilizers and soil amendments; analysis of soils and crops relative to needs for the application of fertilizers; evaluation of nutrient deficiency symptoms of crops; present day practices and new developments in the application of fertilizers; and the use of soil amendments in California.

Prerequisites: PSc 324, SS 221

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For further information address inquiries to:

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California State Polytechnic College

San Luis Obispo, or San Dimas, California

Date _____

I am interested in _____
(Indicate contemplated major course of study from courses listed above)

Please send me full information and an Application for Admission Form.

Applicant's name _____
(Please Print)

Applicant's mailing address _____
(Please Print)

AGRICULTURE

Agricultural Engineering	Field Crop Production
* Agricultural Inspection	Ornamental Horticulture
Animal Husbandry	Poultry Husbandry
* Citrus Fruit Production	Soil Science
Dairy Husbandry	Truck Crop Production
Dairy Manufacturing	* Ornamental Horticulture
Deciduous Fruit Production	* General Crops Production

ENGINEERING

Aeronautical Engineering	Electrical Engineering
Air Conditioning and Refrigeration	Electronic and Radio Engineering
Engineering	Maintenance Engineering
Architectural Engineering	Mechanical Engineering
Printing	

LIBERAL ARTS

Agricultural Journalism	Mathematics	Physical Science
Biological Science	Physical Education	Social Science

* The first three years in these majors must be completed at the Voorhis Unit at San Dimas.

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